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THE UTILITY OF THE THEORY OF PLANNED BEHAVIOR FOR PREDICTING
AND UNDERSTANDING TRAINING BEHAVIOR IN ADOLESCENT
COMPETITIVE SWIMMERS

BY

WILLIAM KERRY MUMMERY



A THESIS
SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH IN
PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY

DEPARTMENT OF PHYSICAL EDUCATION AND SPORT STUDIES

EDMONTON, ALBERTA

FALL, 1994



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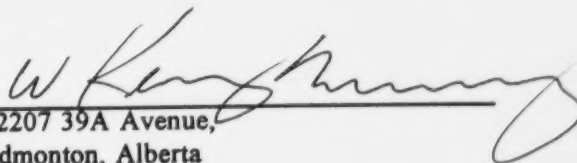
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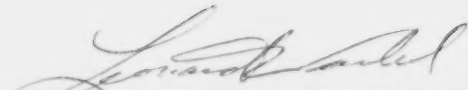
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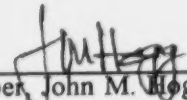
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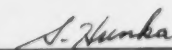
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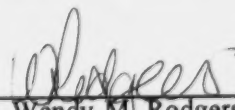
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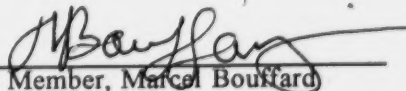
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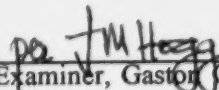
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DEDICATION

This work is dedicated to my wife Christine, and my daughters Jessica and Megan. All of whom I love dearly. Each have endured my years spent in the pursuit of knowledge. Although that pursuit is not now, nor will it ever be complete, this milestone is for them. Only through their love and support have I been able to complete this work.

ABSTRACT

This research involved the testing of the ability of the theory of planned behavior (Ajzen, 1985, 1991) to predict training behavior in adolescent competitive swimmers. Variables examined from the model included: i) intention; ii) direct measures of attitude, subjective norm and perceived behavioral control and; iii) indirect measures of behavioral, normative and control beliefs. Variables included in the analysis which were considered external to the theory of planned behavior included: i) age; ii) competitive level; iii) career length and; iv) adolescent self-perception profile domains (Harter, 1988) of global self-worth, behavioral conduct, close friendship and athletic competence. As recommended by Ajzen and Fishbein (1980), a pilot study consisting of 24 adolescent competitive swimmers was conducted to assist in the preparation of the final testing instrument. The final sample consisted of 169 adolescent competitive swimmers from 11 different Canadian competitive swimming clubs.

Results showed training intention was significantly related to the four training behaviors selected for use in this study. The theory of planned behavior ($R=.56$) accounted for a significantly larger portion of the variance in training intention than did the theory of reasoned action ($R=.39$). The direct measures of attitude towards the behavior ($r=.33$, $\beta=.20$) and perceived behavioral control ($r=.51$, $\beta=.43$) were found to make significant contributions to the prediction of training intention, whereas the measure of subjective norm was not ($r=.30$, $\beta=.10$). A subsequent split of the direct measure of attitude into affective and instrumental components (cf., Ajzen & Driver, 1992) shed more light on the attitudinal contribution to the prediction of training intention. The instrumental measure of attitude ($r=.41$, $\beta=.35$) made a significant contribution to the prediction of training intention, whereas the affective measure ($r=.22$, $\beta=-.05$) did not. Competence domain measures of close friendship ($r=-.17$, $\beta=-.23$) and behavioral conduct ($r=.31$, $\beta=.30$) were found to make a significant contribution to the prediction of attitude towards the behavior, and the measure of global self-worth ($r=.31$, $\beta=.30$) was found to contribute to the prediction of the indirect behavioral belief measure.

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The completion of this dissertation represents a significant personal accomplishment. As I reach the end of this long, and particularly winding road, I now have a chance to reflect on the contributions others have made in assisting me to reach my goal. In each instance I can see that without the help of these individuals the completion of this project would not have been possible. To begin I acknowledge the contribution and leadership of my advisor Dr. Leonard Wankel. His knowledge, support and patience will always be appreciated. In addition, I thank the members of my committee; Dr. John Hogg, Dr. Marcel Bouffard, Dr. Steven Hunka, Dr. Wendy Rodgers and Dr. Gaston Godin. Each made a substantial contribution to the completion of this work, and the final product is much stronger because of it.

On a more personal note, I acknowledge the love and assistance of my wife Christine, daughters Jessica and Megan, and of my parents, Helen and Bill Mummery. The unfailing support of each of these individuals over the years developed in me the confidence required to complete this project.

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CHAPTER, I

INTRODUCTION

1.1 Overview

The past few decades have seen tremendous improvements in the level of performance in competitive swimming. Records at the international, national and provincial levels of competition are constantly being broken. Although the reasons for these improvements are multi-faceted, one of the principle contributors to the rise in performance is the improved understanding, and prescription, of training programs (Bompa, 1983). The basic aim of such a training program has been summarized by Dick (1978) as being:

- i) the improved efficiency of energy production (conditioning), and
- ii) the improved efficiency of energy expression (technique and conditioning).

The ultimate expression of a successful training program is increased athletic performance.

In his seminal work, *The Theory and Methodology of Training*, Bompa (1983) defines training as a "systematic athletic activity of long duration, progressively and individually graded, aimed at modelling the human's physiological and psychological functions to meet demanding tasks" (p.2). According to Bompa, the primary training principle required to achieve maximum athletic performance is conscientious participation by the athlete. The athlete must adhere to training to gain the desired results from a correctly designed and managed program.

Research in the area of sport psychology has neglected the study of training adherence. Instead, research has focused on sport performance or participation. Performance related research has studied the direct relationship between various psychological measures or treatments and performance, whereas participation research has focused on the underlying motivations for continued participation. What remains is a need to study effortful preparation in training made by participants and the motives underlying

decisions to train at the required frequency, duration and intensity. An understanding of the psychological and motivational underpinnings of training adherence acknowledges the important contribution of training to performance, thereby providing the promise for enhanced performance through improved training behavior.

This research will focus on the study of training adherence in adolescent competitive swimmers. The theory of planned behavior (Ajzen, 1985, 1991; Ajzen & Madden, 1986; Ajzen & Driver, 1991, 1992; Schifter & Ajzen, 1985) is the theoretical framework used to investigate the effects of age, competitive level, competitive history and four self-perception domains of athletic competence, behavioral conduct, close friendship, and global self-worth as assessed by the Adolescent Self-Perception Profile (Harter, 1988) on training intention and behavior.

The theory of planned behavior, an extension of the theory of reasoned action¹ (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975) allows for the systematic study of variables which directly and indirectly influence behavior. In addition, the theory provides a model which provides a systematic series of relationships which integrates the effects of personality or trait-like measures of the self, such as Harter's Adolescent Self-Perception profile, with measures of attitude, intention and behavior.

The theory of planned behavior was developed to assist in the prediction and understanding of specific behaviors. According to the theory, the most immediate determinant of an individual's behavior is his/her specific behavioral intention, that is, the intention the individual has to perform a specific act in a specific time-frame. Behavioral intention, in turn, is determined by three factors: the individual's attitude towards the behavior, the individual's subjective norm and the individual's perceived behavioral control. An individual's attitude towards the behavior reflects his/her judgement regarding

¹ The theory of planned behavior differs from the theory of reasoned action only in the addition of the direct measure of perceived behavioral control and related indirect control beliefs. For purposes of this research the external variables described in the theory of reasoned action (Fishbein & Ajzen, 1975) will be incorporated into the theory of planned behavior.

the positive or negative consequences of carrying out the behavior. Subjective norm is the person's perception that significant others think he/she should perform the behavior in question and perceived behavioral control refers to the perceived ease or difficulty of performing the behavior in question. These three factors must be specific to the behavior in action, target, time and context. For example, an individual's training behavior may be operationalized as attending (action) the prescribed training sessions (target) during the next training cycle (time) in the sport of competitive swimming (context).

A set of behavioral, normative and control beliefs are theorized to underlie the direct predictors of attitude, subjective norm and perceived behavioral control. According to the theory of planned behavior these underlying beliefs affect the direct predictors and are significant in bringing about behavioral change. The theory proposes that behavioral change is a product of changes in these underlying beliefs.

The theoretical framework also allows for the investigation of the effects of variables considered external to the model itself (Fishbein & Ajzen, 1975). External variables include: demographic variables such as age, gender, occupation and education; global measures of attitudes towards people or institutions; and personality traits. External variables are proposed to influence specific behaviors only if they are related to one or more of the direct measures of the theory of planned behavior. Age, gender, career length, competitive level, and training volume are variables external to the theory of planned behavior which will be employed in the investigation of training behavior in the adolescent athlete. In addition, the effects of the theoretical construct of perceived competence will be investigated. In sum, this research will examine the utility of the extended² model of the theory of planned behavior in the investigation of training behavior.

²the terminology "extended model" of the theory of planned behavior has been used to reflect the complete model including external measures. To date, the vast majority of the research using the theories of reasoned action/planned behavior has been limited to prediction of intention and behavior from a combination of the direct measures of the theory.

This research will investigate the ability of the theory of planned behavior to predict training behavior in adolescent competitive swimmers. Specifically, this research will investigate the relation between behavioral intention and behavior. In addition, the relative ability of the direct and indirect measures of the theory of planned behavior to predict intention and behavior will be studied. Finally, the effects of age, gender, career length, competitive level, and Adolescent Self-Perception Profile measures (Harter, 1988) of athletic competence, behavioral conduct, close friendships and global self-worth on the measures of the theory of planned behavior will be examined.

1.2 Statement of the Problem

The general purpose of this research is to study the utility of the theory of planned behavior in the prediction and understanding of training behavior in adolescent competitive swimmers.

Specific objectives relating to the overall objective include:

- i) To investigate the relationship of behavioral intention to training behavior in adolescent competitive swimmers.
- ii) To investigate the relative contributions of the direct measures of attitude, subjective norm and perceived behavioral control to the prediction and interpretation of behavioral intention and training behaviors in adolescent competitive swimmers.
- iii) To investigate the relationships of the behavioral, normative and control beliefs on the direct measures of attitude towards the behavior, subjective norm and perceived behavioral control, behavioral intention and training behaviors in adolescent competitive swimmers.

- iv) To investigate the effects of selected personal variables (i.e., age, gender, competitive level, competitive history) and measures of individual differences in selected domains of perceived competence (i.e., athletic competence, behavioral conduct, close friendship and global self-worth) on the individual's beliefs, attitudes, subjective norm, perceived behavioral control, behavioral intentions and observed behavior.
- v) To compare the relative efficacy of the theory of planned behavior to its predecessor, the theory of reasoned action in the prediction of training intention and training behavior in order to assess the extent to which training in the sport of competitive swimming is under volitional control.
- vi) To assess the relative contributions of affective and instrumental components of the direct measure of attitude to behavioral intention and training behaviors in adolescent competitive swimmers.

1.3 Hypotheses

The use of the theory of planned behavior allows for the establishment of a series of specific hypotheses.

- H1)** There will be a significant relationship between individuals' behavioral intention and subsequent behavior. (Fishbein & Ajzen, 1975; Ajzen & Fishbein, 1980; Ajzen, 1985, 1991).
- H2)** The inclusion of the measure of perceived behavioral control with the direct measures of attitude and subjective norm will significantly add to the prediction of behavioral intention when compared to the predictive ability of the measures of attitude and subjective norm alone. (Ajzen, 1985, 1991; Ajzen & Madden,

1986; Ajzen & Driver, 1991, 1992; Schifter & Ajzen, 1985).

- H3)** The direct measures of the theory of planned behavior (attitude, subjective norm, perceived behavioral control) will predict a significantly larger portion of the population's behavioral intent than the indirect measures of behavioral, normative and control beliefs. (Fishbein and Ajzen, 1975, Ajzen, 1985, 1987, 1991).
- H4)** The effects of the external variables of age, gender, competitive experience, competitive level, training volume, athletic competence, behavioral conduct, close friendship and global self-worth on behavioral intention and subsequent behavior will be mediated by the direct and indirect measures of the theory of planned behavior. (Fishbein & Ajzen, 1975, Ajzen & Fishbein, 1980; Ajzen, 1985, 1987, 1991).

1.4 Justification

The present study acknowledges the need for conscientious training behavior by the adolescent athlete to achieve performance gains in the sport of competitive swimming. If a better understanding of the determinants of training behavior is obtained, then there exists the possibility of enhancing the training environment to increase adherence to the prescribed training programs. This may prove to be possible by removing or reducing barriers or constraints to training adherence as identified through the proposed research or by altering beliefs towards training or normative determinants impacting on training intention and/or behavior. If increased understanding of the behavioral determinants of training can assist in the improvement of training behavior, then a subsequent performance improvement can be expected. Increased performance may have positive effects on participatory behavior. The promise of an increase in actual competence brings with it the possibility of an increase in perceived competence. Research has shown a positive relationship between perceived competence and length of sport involvement (Roberts, Klieber & Duda, 1981; Feltz & Petlichkoff, 1983), peer acceptance (Weiss & Duncan,

1992), and, performance satisfaction (Kimiecik, Allison & Duda, 1986).

This research allows for testing of the full model of the theory of planned behavior. Incorporating selected external variables into the study allows for a richer view of variables affecting behavior in the competitive setting. Although Godin and Shephard (1986) examined the effects of socio-demographic variables of the extended version of the theory of reasoned action, no comparable work has been conducted with the theory of planned behavior. To date, no work has been conducted examining the effects of individual differences, as operationalized by the selected domains of the Adolescent Self-Perception Profile (Harter, 1988), on the components of the theory of planned behavior. Ajzen (1991) argues that cross-situational measures of personality influence specific behaviors only indirectly by influencing some of the factors more closely linked to the behavior in question (i.e., underlying beliefs, attitudes, subjective norm, perceived behavioral control). Various authors (e.g., Bandura, 1986) have discussed the difficulties associated with attaining successful behavioral predictions from cross-situational behavioral measures. Other authors (e.g., Harter, 1978) have developed theoretical frameworks which have become popular in sport psychology research based on such cross-situational behavioral measures.

This research will examine the mediating effects of the measures of the theory of planned behavior on aggregate measures of perceived competence. The relationships between domain specific measures of athletic competence, behavioral conduct, close friendship and global self-worth and training behavior in adolescent competitive swimmers will be studied using the framework of the theory of planned behavior. In addition, effects of demographic information such as age, gender, competitive level, career length, and training volume will be examined.

A large body of research has developed around Harter's theory of perceived competence in the sport domain (e.g., Roberts, Klieber & Duda, 1981; Feltz & Petlichkoff, 1983; Horn, 1985; Kimiecik, Allison & Duda, 1986; Klint & Weiss, 1987;

Weiss, McAuley, Ebbeck & Wiese, 1990). Much of this research has been aimed at participatory behavior in sport. Participation in most of the studies has been measured in all-or-none terms, rather than on a continuum of training compliance as proposed in this research. If the domain measures of the adolescent self-perception profile are related to the direct or indirect measures of the theory of planned behavior, and those measures are subsequently related to behavioral intention and/or behavior, then the mediating ability of the direct and indirect measures of attitudes to behavior will be demonstrated. This would illustrate the ability for attitudinal measures to act as a link between trait-like personality variables and specific behaviors. This would assist in the explanation of the inherent weakness of such aggregate measures of the individual to predict specific behavior (Bem & Allen, 1974).

1.5 Limitations

This research is prospective in design. No control could be asserted over various elements of the theory of planned behavior.

In order to provide adequate power for analysis approximately 10 cases per independent variable was required (Tabachnick & Fidell, 1989). This resulted in a sample size of 169 individuals. To realize this it was necessary to obtain subjects from a number of different swimming clubs from across Canada. This resulted in a reduction in experimental control over variables extraneous to the present design. It was, for instance, not possible for the principle researcher to be present to collect all of the data. Although every effort was made to instruct and educate the participating club-representatives in the methods used to collect the self-report data from the participating swimmers, data collection errors were still detected in the returned materials.

The study used criterion based-sampling with self-selection by the participating club/coaches. In an effort to ensure direct contact between the participating coach, swimmer and researcher, only clubs whose head coach directly coached the participating athletes

were selected for inclusion of the study. Given the age range of the athletes this produced a sample including a grouping of medium-sized Canadian swim clubs. In addition, the participating club coaches self-selected for participation which may have led to a systematic removal of certain behavioral types (i.e. clubs with a high number of poorly behaved swimmers) from the sample. Although the sample is reflective of the club-level swimmers from across the country, the sample was not randomly drawn from the Canadian swimming population and therefore cannot be considered to be representative to the overall swimming population.

The results and conclusions of the present research must be limited to the theoretical frameworks utilized within this study. The questionnaire, although extensive, is not exhaustive in the assessment of variables utilized within this study. In addition, there was no opportunity for test-retest of the questionnaire. Although there exists evidence that measuring the constructs of attitude and intention on only one occasion is sufficient to ensure high levels of reliability (Valois, Godin & Bertrand, 1992), the findings of this study must be limited to the time frame examined.

1.6 Delimitations

The scope of this study will be delimited as follows:

- i) The subject sample will be delimited to athletes aged 12 through 18 years who train a minimum of six sessions per week for a registered Canadian swimming club.
- ii) The training period was delimited to a three week period during "heavy" training.
- iii) The training behaviors were delimited to three coach generated, and one athlete generated measure of behavior.

This research is based on a self-selected criterion-based sample drawn from consenting competitive swimming clubs from across Canada. In light of this fact generalizations to other sports will not be possible.

1.7 Definition of Terms

Adherence; Although the athletes are in some measure being investigated for their adherence to the training program prescribed by their coach the duration of the study was only in the range of two weeks. In accordance to the recommendation of Haynes (1979) the term compliance was utilized to reflect the relatively short duration of the behavioral study.

Affective Attitude; A division of the direct or global measure of attitude toward the behavior, affective attitudes are those measures obtained with the use of a semantic differential scale which are associated with positive or negative feelings (Ajzen & Driver, 1991).

Affective Behavioral Beliefs; Affective behavioral beliefs are beliefs about the positive or negative feelings derived from engaging in a given behavior. A subdivision of the behavioral belief measure (Ajzen & Driver, 1991).

Athletic Competence; Athletic competence is a specific domain as tapped by Harter's (1988) Adolescent Self-Perception Profile. This subscale taps the individual's perceptions of his or her athletic ability and competence at sports.

Attitude Toward The Behavior; The attitude towards the behavior is the direct measure of the individual's judgement regarding the positive or negative nature of the outcome arising from the performance of the behavior. The attitude towards the behavior is the personal factor which is theorized to contribute to the determination of intention (Ajzen, 1991).

Behavioral Beliefs; Behavioral beliefs are a set of salient beliefs an individual holds regarding the cost or benefit incurred by performing that behavior. These beliefs are assumed by the theory of planned behavior to influence attitude toward the behavior

(Ajzen, 1991).

Behavioral Conduct; Behavioral conduct is a specific domain as tapped by Harter's (1988) Adolescent Self-Perception Profile. This subscale taps the degree to which one likes the way one behaves, does the right thing, acts the way one is supposed to, and avoids getting into trouble.

Belief-Based Measures of Attitude; The belief-based measure of attitude are the sum of the products of each behavioral belief and the corresponding subjective evaluation. The direct measure of attitude toward the behavior is hypothesized to be directly proportional to the sum of the belief based measure of attitude.

Belief-Based Measures of Perceived Behavioral Control; The belief-based measures of perceived behavioral control are the sum of the product of each control belief and corresponding perceived power measure. It is proposed that the belief-based measure of perceived behavioral control are directly related to perceived behavioral control.

Belief-Based Measures of Subjective Norm; The belief-based measures of subjective norm are the sum of the products of each normative belief and the corresponding motivation to comply. A person's global subjective norm is proposed to be directly related to the belief based measure of subjective norm.

Close Friendships; Close friendships is a specific domain as tapped by Harter's (1988) Adolescent Self-Perception Profile. This subscale taps one's ability to make close friends that one can share his/her personal thoughts and secrets with.

Compliance; For purposes of this research the term compliance refers to the individual's following of the prescriptive advice of the coach in the training pool. This use of the term reflects the recommendations of Haynes (1979) in the health-care field, distinguishing the terms compliance and adherence as being short term and long term

behavioral patterns respectively.

Control Beliefs; Control beliefs are those held by a person regarding the presence or absence of resources and or opportunities required to complete an action (Ajzen, 1991).

Direct Measures; The direct measures of the theory of planned behavior (also termed global measures by Ajzen, 1985) include i) attitude toward the behavior, ii) subjective norm and iii) perceived behavioral control.

External Variables; Demographic and personal variables included in the research, but not encompassed within the theory of planned behavior are termed external variables. These include the demographic variables of age, gender, competitive level and career length; and the personal variables of athletic competence, behavioral conduct, close friendship and global self-worth obtained from the Adolescent Self-Perception Profile (Ajzen, 1985).

Global Self-worth; Global self-worth is a global measure as tapped by Harter's (1988) Adolescent Self-Perception Profile. These items tap the extent to which the adolescent likes oneself as a person, is happy the way one is leading one's life and is generally happy with the way one is. It therefore makes up a global judgement of one's worth as a person, rather than domain-specific competency or adequacy.

Instrumental Attitude; A division of the direct or global measure of attitude toward the behavior, instrumental attitudes are those measures obtained with the use of a semantic differential scale which are associated with the value or usefulness of the behavior (Ajzen & Driver, 1991).

Indirect Measures; The indirect measures are the belief systems which operate as the antecedents of the direct measures. These beliefs provide the most basic level of

explanation according to the theory of planned behavior. Indirect measures operate as a set of expectancy value measures which are proposed to determine the related direct measures of the theory of planned behavior. The direct measures include: i) behavioral beliefs and subjective evaluation, ii) normative beliefs and motivation to comply, and iii) control beliefs and perceived power.

Instrumental Behavioral Beliefs; Instrumental behavioral beliefs about the costs and/or benefits of engaging in a given behavior. A subdivision of the behavioral belief measure (Ajzen & Driver, 1991).

Intention; An intention is a behavioral disposition towards the performance of a specific behavioral act or category. In accordance with Ajzen (1988, p. 113) intentions are "indications of how hard people are willing to try, of how much of an effort they are planning to exert, in order to perform the behavior."

Motivation to Comply; Motivation to comply is the strength of the individual's belief that he or she should in fact do what other individuals or groups believe he or she should, or should not, do (Ajzen, 1991).

Normative Beliefs; Normative beliefs are beliefs that individuals have regarding the feelings that others hold toward their performance or non-performance of the behavior in question (Ajzen, 1991).

Perceived Behavioral Control; Perceived behavioral control is the efficacious measure of the person's beliefs as to his or her ability to summon the required resources, both internal and external, to carry out the specific behavior (Ajzen, 1991).

Perceived Power; Perceived power is the measure of the strength of the individual's belief that the presence or absence of a required resource will impact on his or her ability to carry out the action (Ajzen, 1991).

Subjective Evaluation; The subjective evaluation is the individual's perception of the relative importance of the perceived outcome of the act (Ajzen, 1991).

Subjective Norm; The subjective norm is the social factor contributing to the formation of intention. This direct measure represents the person's perception that important others desire the performance or non-performance of the specific behavior (Ajzen, 1991).

Training Attendance; The measure of training attendance refers to the number of training sessions attended divided by the number of training sessions prescribed, expressed as a percentage. This information was obtained from the coach report.

Training Behavior, Training behavior refers to the multiple indicators of the subjective measures of i) coach report and ii) swimmer's self-report regarding his or her compliance to the prescribed frequency, duration and intensity of training, and to the objective measures of iii) training attendance and iv) training volume.

Training Volume; The measure of training volume was the number of meters completed during the study period, divided by the number of meters assigned during the study period, expressed as a percentage. This information was obtained from the coach report.

CHAPTER II

REVIEW OF LITERATURE

The present study investigates the attitudes, beliefs and self-perceptions underlying training behavior in adolescent competitive swimmers. The approach uses a social-psychological theory, the theory of planned behavior (Ajzen, 1985, 1991; Ajzen and Madden, 1986; Ajzen & Driver, 1991, 1992; Schifter & Ajzen, 1985), which has been utilized in a wide range of behavioral settings, to predict training behavior in adolescent competitive swimmers. In addition, selected variables considered external to the theory will be used to study their effects on the constructs of the theory. Specifically, measures of perceived competence, as operationalized by Harter's (1988) Adolescent Self-Perception Profile have been selected for inclusion. Such measures of self-competence have long been given motivational qualities, yet little success has been obtained in predicting specific behaviors. The theory of planned behavior offers a means of linking evaluative measures of the self to behavior through a sequence of beliefs, attitudes and intention. This chapter begins with a review of the theory of planned behavior and includes a review of Harter's competence motivation theory.

The theory of planned behavior (Ajzen, 1985, 1991) is a relatively recent extension of the theory of reasoned action (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975). As the theory of reasoned action lays the groundwork for the theory of planned behavior it is appropriate to provide an overview of both the theory of reasoned action and the recent extension, the theory of planned behavior.

2.1 The Theory of Reasoned Action

The theory of reasoned action (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975), illustrated in Figure 2.1, is based upon two fundamental assumptions: (i) the behavior in question is under volitional control, and (ii) that the person's intention to perform (or not perform) the behavior is the immediate determinant of action. The theory emphasises

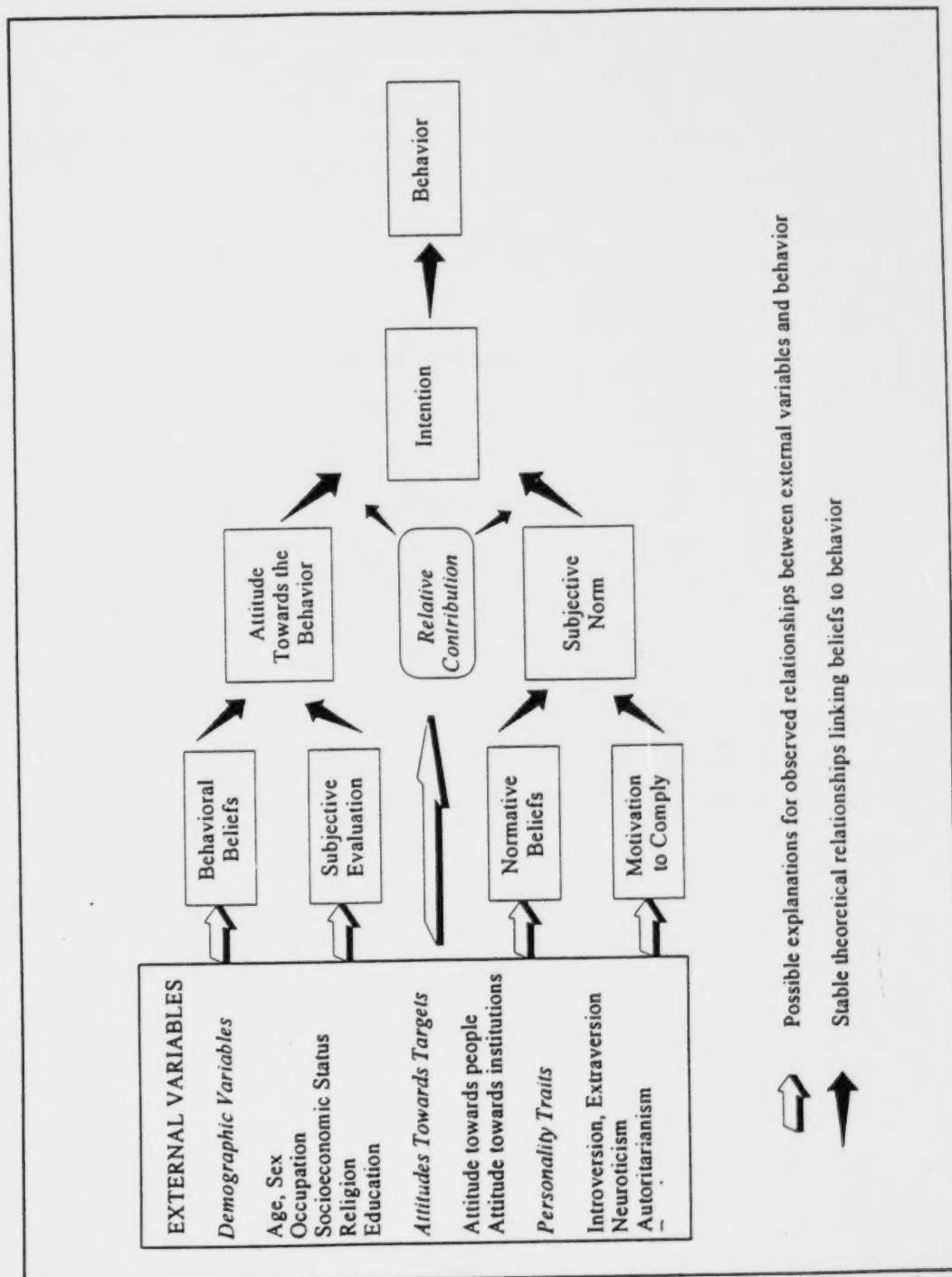


Figure 2.1 Schematic representation of the theory of reasoned action (Adapted from Ajzen & Fishbein, 1975).

cognition and cognitive processes, refuting theoretical orientations which subscribe to the view that human social behavior is controlled by unconscious motives or overpowering desires. Instead, Ajzen and Fishbein (1980, p.5) argue that people "consider the implications of their actions before they decide to engage or not to engage in a given behavior". This led Ajzen and Fishbein to name their approach a theory of reasoned action. In its entirety, the theory encompasses five levels including: (i) behavior, (ii) intention, (iii) direct measures, (iv) indirect measures and, (v) external variables.

At the first level of the theory, Ajzen and Fishbein (1980) identify the need to be able to identify and measure the behavior in question. A distinction is made between behaviors and occurrences which may be outcomes of those behaviors. Athletic performance, for instance, is an outcome not a behavior. Such a performance is not a measure of behavior, but rather an outcome of such specific actions as training persistence and energy expenditure in the competitive situation. The first step in the operationalization of the theory of reasoned action is therefore, to decide if one is dealing with a behavior or with an outcome of a behavior. The case of an outcome of a behavior being the target of study is much more difficult to deal with than a specific behavior because, as Ajzen and Fishbein note (1980, p.30) "many different behaviors can lead to the same outcome". An athletic performance may be attributed to a multitude of converging factors but it can rarely be accredited to a specific behavioral act.

In order to overcome some of the historical predictive shortcomings of attitudinal research (cf., Wicker, 1969), Ajzen and Fishbein identified the need to distinguish the contextual and temporal elements of the behavioral act or category under study. Both the contextual and temporal elements may positively or negatively affect the behavioral or normative beliefs of the individual. Ajzen and Fishbein give the example of a person who may drink beer in the local pub but would not drink beer at home (contextual), or would drink beer in the evening but not in the morning (temporal).

Should the investigator be concerned with an individual's behavior over time rather

than on a single instance, measures of relative and absolute frequency may be used. The absolute frequency is simply the number of times the person performed the behavioral criteria in a designated time frame, whereas the relative frequency is the computed percentage or proportion of times that each individual completed the behavioral act relative to the number of times he or she had the opportunity to do so. Ajzen and Fishbein (1980) acknowledge self-report measures can be used to assess behavior. They note that self-reports of behavior, unless there are strong reasons to suspect the respondents have reason to give false or misleading answers, are usually quite accurate.

At the level of intention Ajzen and Fishbein (1980) have identified two factors which may affect the accuracy of the intention-behavior relationship. These factors are: (i) the degree of correspondence between the measure of intention and the behavioral criterion and, (ii) the temporal stability of the measure of intention. In order to gain an accurate prediction of behavior from behavioral intent, the measure of intention must correspond with the measure of behavior in action, target, time and context. Given high scale correspondence between intention and the action, the accuracy of the behavioral prediction may be affected by the temporal stability of intentions. Commonly, the longer the time interval between the assessment of intent and the measurement or performance of the behavioral act the less accurate the prediction of behavior from intention. This is due to the potential for new information to become available to and change the intention of the person. If it was feasible to re-assess intention immediately before the volitional act, one would expect a high intention-behavior relationship to again be displayed. Although a temporal delay between intention and behavioral measures may lead to an erosion of the predictive validity of the theory at the individual level, temporal stability is enhanced when trying to predict groups or aggregations of the population. Ajzen and Fishbein state "aggregate intentions are apt to be much more stable over time than are individual intentions" (1980, p.48).

The third level of the theory of reasoned action deals with the formation of intention. According to the theory, intentions are formed as a result of the combined

evaluative affects of a person's attitude towards the behavior and his/her perceived subjective norm.

Ajzen and Fishbein (1980) define an attitude toward a behavior as "*a person's general feeling of favourableness or unfavourableness for that behavior*" (1980, p.54) and describe a seven-point semantic differential scale as a method to assess the concept. This method has gained widespread acceptance as a suitable method for the assessment of the concept. The attitude toward a behavior can be viewed as overall evaluations that they can be "measured by a procedure which locates respondents on a bipolar evaluative dimension" (1980, p.56).

Subjective norm is the "*person's perception that important others desire the performance or non-performance of the behavior*" (Ajzen and Fishbein, 1980, p.57). In a fashion similar to the measure for the attitude towards the behavior, subjective norm has typically been measured with a dichotomous graded scale (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975). Controlling for attitude towards a behavior, it is assumed that the more an individual perceives that others important to him or her wish the performance of a given behavior, the higher the subsequent intention to perform the behavior. Similar to the attitude-intention relationship, the measure of subjective norm must display congruence in action, target, time and context with the measure of intention.

The fourth level of the theory of reasoned action consists of expectancy-value measures which are proposed to indirectly influence behavioral intention by affecting the formation of the direct measures of attitude and subjective norm. Attitude towards a behavior is considered to be proportional to the sum of the products of a set of *behavioral beliefs* and related *subjective evaluations*. Behavioral beliefs are those beliefs held by the person regarding the consequence arising from specific behaviors. The corresponding subjective evaluation refers to the relative value the person places on the related consequence or outcome. A person's subjective norm is a function of a set of *normative beliefs* weighted by his or her *motivation to comply*. The normative beliefs involve

specific individuals or groups which the person believes hold the opinion that he or she should (or should not) perform the behavior in question. Although similar in concept to subjective norm, the normative beliefs involve only specific individuals or groups of individual rather than the overall perception evaluated in the assessment of subjective norm. Once the knowledge of a person's beliefs about significant referents is obtained, his or her general motivation to comply with each referent is required to obtain the expectancy-value equation described above.

Since the indirect belief measures are viewed as determinants of the direct measures, and the direct measures are used to predict intention, it is possible for intention to be directly predicted from the indirect beliefs if a number of conditions are met (Ajzen & Fishbein, 1980). First, the indirect belief measures must be significantly related to the direct measures. Second, the direct measures must be significantly related to intention. The theory cannot be tested by examining the relationships between beliefs and either intentions or behavior when these conditions are not met.

To this point the theory of reasoned action has made no reference to other numerous factors which behavioral scientists have utilized in the effort to predict and explain behavior. Fishbein and Ajzen acknowledge the potential influence of such variables as personality traits and socio-economic characteristics on behavior but consider them to be *external variables* to the theory. An external variable will have an affect on behavior only to the extent that it influences the individual's behavioral determinants of normative and behavioral beliefs, attitude towards the behavior, subjective norm and intention. The theory of reasoned action is acknowledged by Ajzen and Fishbein to deal mainly with the factors that intervene between the external variables and behavior.

2.1.1 Empirical Research Utilizing the Theory of Reasoned Action

Predictive validity for the theory of reasoned action has been established through

successful application of the theory in a large number of diverse behavioral settings. Support for the predictions of the theory has been obtained with behaviors such as nurses' charting behavior (Renfroe, O'Sullivan and McGee, 1990), charitable intent (Pryor, 1990), consumer-related behavior (Bagozzi and Warshaw, 1990; Prancer, George and Gebots, 1992), nurses' career behavior (Lane, Mathews and Presthold, 1988, 1991), learning behavior (Norwich and Jaeger, 1989; Norwich and Duncan, 1990), and religious behavior (Gorsuch and Wakeman, 1991).

Sheppard, Hartwick and Warshaw (1988) conducted two meta-analytic studies on research which provided direct tests of the theory of reasoned action. In all, 87 separate studies of the intention-behavior relationship, and 87 separate studies of the attitude-subjective norm-intention relationship were included. Based on the analysis of the included studies, the authors found a frequency-weighted average correlation for the intention-behavior relationship of 0.53 ($p < .01$). After examining the studies involving the attitude-subjective norm-intention relationships the authors reported a frequency weighted average correlation of 0.66 ($p < .001$). These two findings led the authors to conclude that strong support was provided for the overall predictive utility of the theory of reasoned action.

Of specific interest are the articles which deal with health-related behaviors and physical activity. Both of these behavioral areas involve adherence or compliance to prescribed regimes.

2.1.1.1 The Theory of Reasoned Action and Health Related Behaviors.

A number of studies have used the theory of reasoned action to study medication compliance. Austin (1989) studied parental compliance in giving prescribed anticonvulsant medication to their children. The combination of subjective norm and attitude towards the behavior predicted a significant portion of the variance in the measure of behavioral intent ($R = .62$). At this level, subjective norm ($\beta = .58$) made a larger contribution to the

prediction of medication intention than did attitude ($\beta=.37$). The measure of behavioral intention was significantly related to medicine giving behavior ($r=.44$, $p<.01$). The addition of attitude and subjective norm on the second step of the analysis improved the prediction of behavior with only attitude making a significant contribution. Brubaker, Prue and Rychtarik (1987) used the theory to study variables influencing disulfiram requests among male alcoholics. Results revealed significant correlations among components of the model consistent with the assumptions of the theory. Significant differences were found between disulfiram requesters and rejectors at the level of behavioral and normative beliefs about the consequences of being placed on the drug. Cochran and Gitlin (1988) investigated predictions of lithium noncompliance, which is proposed to be a significant barrier to effective treatment of manic-depressive disorders. The results supported the usefulness of the model with normative beliefs predicting subjective norms, which, together with positive attitude toward lithium treatment, predicted intention to comply. Results indicated that intent to comply was the strongest predictor of self-reported level of compliance. Reid and Christensen (1988) successfully used a combination of indirect behavioral beliefs and behavioral intent to predict a significant portion of the variance in subjects' compliance to prescribed medication. The authors reported that the product of the normative belief and motivation to comply measures made a significant contribution to the prediction of intent but failed to add to the prediction of compliant behavior. Miller, Wikoff and Hiatt (1992), in a study involving medication compliance in hypertensive patients, reported behavioral intention was significantly related to compliant behavior. Intention was directly related to attitude and motivation to comply and indirectly to the perceived beliefs of others.

De Weert, Visser, Kok and Der Veen (1990) studied four diabetic self-care behaviors using the theory of reasoned action. Intention was significantly related to the behavioral measures for home blood glucose monitoring ($r=.53$, $p<.05$), nutritional intake ($r=.52$, $p<.05$), self-devised insulin dosage adjustment ($r=.380$, $p<.05$), and regular exercise ($r=.67$, $p<.05$). Measures of attitude and subjective norm (operationalized as social norm within the study) were significantly related to intention for each behavior. The addition

of a measure of diabetic self-care knowledge to the model improved the prediction of intention above that of the direct and indirect measures of the theory for each behavior.

The theory of reasoned action has been used in the study of cancer self-examination for both males and females. Brubaker and Fowler (1990) evaluated the use of a persuasive message based on the theory of reasoned action in order to increase college males testicular self-examination (TSE) intention and behavior. Behavioral intention was the only variable significantly related to behavior ($r=.425, p<.05$). Path analysis revealed significant paths between attitude ($r=.380, p<.05$), subjective norm ($r=.141, p<.05$) and intention. Addition of measures of self-efficacy ($r=.200, p<.05$), TSE knowledge ($r=.178, p<.05$) and message exposure ($r=.258, p<.05$) also displayed significant path relationships to intention. Lierman, Young, Kasprzyk and Benoliel (1990) studied breast self-examination intention and behavior in women. Although a significant amount of the variance in intention and breast self-examination frequency was predicted using the measures of attitude and subjective norm, indirect belief-based measures accounted for more of the variance in actual behavior than did the measure of intention. Timko (1987) examined the cognitive structures underlying women's intentions to seek medical care for a breast cancer symptom using the theory of reasoned action. Intentions to delay seeking medical care were positively associated with favourable attitudes toward delay and with perceived social pressure to delay. Attitude made a larger contribution to the prediction of intention than did subjective norm. Hill, Gardener and Rassaby (1985) used the theory of reasoned action to identify factors related to women's intentions to perform breast self-examination and have a Pap test. The measures of attitude and subjective norm both made significant contributions to the prediction of intention for each behavior. In addition, the authors concluded that a composite model including measures of perceived barriers to completing the behaviors provided a significant prediction of behavioral intention.

In a study of seat-belt use among undergraduates, Budd, North and Spencer (1984) found that direct measures of attitude and subjective norm made significant contributions

to the prediction of intentions to wear seat belts in a number of different driving situations. The addition of a self-report measure of past behavior was found to significantly increase the prediction of seat belt use intent. Martin and Newman (1990) studied the relationship of behavioral and normative beliefs to women's intention to use seatbelts. It was reported that women who intended to use seatbelts differed from non-intenders at the level of behavioral beliefs. Both intenders and non-intenders valued saving lives, feeling safer and the reduction in the likelihood of injuries. However, the groups differed on their beliefs that seatbelt usage would accomplish this aim. Intenders believed that the use of seatbelts would accomplish the goal of increased safety whereas non-intenders did not. Stasson and Fishbein (1990) evaluated the effects of attitude, subjective norm and perceived risk on the intentions of 79 licensed drivers to use seatbelts in a total of 12 different driving situations. Subjective norm and attitude towards the behavior were positively and significantly related to behavioral intention in all twelve driving situations. Attitude made the largest contribution to the prediction in nine of the twelve situations (β range=.32 to .70, median =.51) presented to the subjects while subjective norm made the largest contribution in the other three (β range=.08 to .53, median =.32). The measure of perceived risk failed to make a significant contribution to the prediction of intention in eight of the twelve situations and made a smaller contribution than attitude and subjective norm in the other four situations (β range=.03 to .29, median =.12).

The theory of reasoned action has also been applied to dental hygiene behavior. Toneatto and Binik (1987) used the theory as an explanatory model for dental flossing. Intention to floss, measured on a single 7-point scale was found to be significantly related to flossing behavior. Both the measures of attitude and subjective norm made a significant contribution to the prediction of flossing intention. In addition, the attitude measure contributed to the prediction of flossing behavior beyond that made by intention alone. Subjective norm, however, was mediated through the intention measure and made no direct contribution to the prediction of flossing behavior. Tedesco, Keffer and Fleck-Kandath (1991) studied compliance in 54 oral health patients to recommended brushing

and flossing behaviors. Intention to brush ($r=.68, p<.05$) and intention to floss ($r=.61, p<.05$) were both significantly related to the corresponding self-reported behavioral measure. The direct measures of attitude towards the behavior and subjective norm were significantly related to intention for both brushing ($r=.67, p<.05$ and $r=.51, p<.05$ respectively) and flossing ($r=.54, p<.05$ and $r=.55, p<.05$ respectively). A measure of self-efficacy regarding the subjects' beliefs about their ability to brush and floss as advised significantly improved the prediction of both brushing ($F_{\text{change}}=8.25, p<.007$) and flossing ($F_{\text{change}}=6.05, p<.02$) behavior.

The theory of reasoned action has been applied to the study of preventative behavior in sexually transmitted diseases. Fishbein, Chan, O'Reilly, Schnell, Wood and Beeker (1992) examined the applicability of the theory of reasoned action as a basis for understanding and predicting gay men's intentions to perform 15 AIDS-related sexual behaviors in three different American cities. Results showed that gay men's intentions were significantly predicted by attitudinal and normative measures. The multiple correlations between the two factors and behavioral intention ranged from .63 to .76 (Median =.66). Although attitudes were consistently the more important determinant of behavioral intention for all subjects and all behaviors, the importance of normative considerations was found to vary across cities leading the authors to conclude that the social environment has distinct effects on the role of subjective norm. Boyd, Wandersman, and Abraham (1991) studied condom usage in a sample of 190 college students. Both attitude towards condom use (β not reported, $p<.0001$) and the measure of subjective norm (β not reported, $p<.0002$) made significant contributions to the prediction of intention to use a condom. Intention explained 27% of the variance in reported condom use behavior ($p<.0001$). Although the measures of attitude and subjective norm did not make a significant contribution to the prediction of behavior beyond that of intention, the authors reported that measures of past behavior (habit) and perceived susceptibility (fear of sexually transmitted diseases) added significantly to the prediction of behavior. Based on the results, an alternative prediction model for condom use was presented that integrated attitude towards the behavior, subjective norm, intention, past behavior and

perceived susceptibility in the prediction of condom use.

In addition to the study of health behaviors from a preventative or promotional perspective, the theory of reasoned action has been applied to behaviors which have negative effects on health. This research includes the study of illicit drug use, smoking behavior and dietary consumption. Budd, Bleiker and Spencer (1983) used the theory to study marijuana usage. Results supported the ability of the theory to differentiate between undergraduate nonusers, experimenters, occasional users, and regular users of marijuana. An interaction between the beliefs and social norms was reported. Grube, Morgan and McGree (1986) tested a model derived from the theory of reasoned action against two alternatives to compare the ability of the models to predict smoking intentions and behavior. Results showed that in both grade school and college students behavioral norms and attitude-normative belief interactions led to significant increases in the prediction of smoking intentions and behavior. Exploratory factor analyses suggested that the beliefs underlying subjective norms were multidimensional rather than uni-dimensional. The authors conclude that the theory of reasoned action should be modified to allow for behavioral norms, the interaction between attitudes and normative beliefs, and the multidimensionality of the beliefs underlying normative influences. Research by Loken (1982) and Norman and Tedeschi (1989) displayed the ability of the theory of reasoned action to predict intentions to smoke. Tuorila and Pangborn (1988) studied the prediction of reported consumption of selected fat-containing foods based on the theory of reasoned action. Favourable attitudes towards a food was the dominant factor predicting intention and reported consumption of 4 fat-containing foods. Weight concern was a significant countering factor to consumption. Subjective norm was found to be insignificant in the prediction of food selection.

2.1.1.2 The Theory of Reasoned Action and Exercise Behavior

Pender and Pender (1986) provided support for the theory of reasoned action in the study of the intentions to engage in health behaviors including diet regulation, stress

management and regular exercise behaviors. The direct measures of attitude towards the behaviors were significant predictors of intention to engage in regular exercise, maintenance of recommended weight and avoidance of a highly stressful lifestyle. The measure of subjective norm made a significant contribution only to the prediction of intentions to engage in exercise. In that case subjective norm was reported to make a larger contribution to the prediction of exercise intention than did the attitudinal measure.

Godin and Shephard (1986b) compared the association between intentions to exercise, reported exercise behavior, and 2 measures of attitudes toward exercise in current and retired university employees stratified by age (45-54, 55-64, and 65-74 years) and sex. Consistent with the theory of reasoned action, attitudes defined in terms of action, target, context, and time elements, were more strongly related to intentions and behavior than were the general measure of attitudes towards physical activity as measured by Kenyon's (1968) attitude inventory. Only attitude, as defined by the theory of reasoned action, made a significant contribution to the prediction of exercise intention ($\beta=.448$, $p<.001$).

Dzewaltowski (1989) compared the ability of Bandura's (1986) social cognitive theory and the theory of reasoned action to predict exercise behavior. A path analysis indicated that the theory of reasoned action fit the data, but explained only 5% of the variance in exercise behavior. Two social cognitive theory variables, self-efficacy and self-evaluated dissatisfaction, significantly predicted exercise behavior. It was concluded that subjects who were confident they could adhere to an exercise program and were satisfied with their standing on probable outcomes from participation exercised more days per week. The author concluded that social cognitive theory was more effective than the theory of reasoned action in predicting exercise behavior.

Theodorakis, Doganis, Bagiatis and Gouthas (1991) examined the ability of the theory to predict the exercise behavior of fifty-six children aged 10-11 years. The measure of attitude was significantly related to exercise intention ($r=.32$, $p<.05$), whereas subjective

norm ($r=.23$, $p=ns$) was not. There was a significant relationship between exercise intention and exercise behavior ($r=.36$, $p<.05$). The combination of attitude towards the behavior and subjective norm explained a significant portion of the variance in the measure of behavioral intention ($R=.44$, $p<.05$) but failed to reliably improve the prediction of behavior beyond that made by the intention measure alone. Behavioral prediction was increased, however, when past behavior was entered in the analysis as an external variable ($R=.59$, $p<.05$). The addition of past exercise behavior was found to predict subsequent exercise behavior in the children better than the measure of intention however, leaving to question the operationalization of the intensive question.

Vallerand, Deshaies, Cuerrier and Pelletier (1992) applied the theory of reasoned action to the prediction of moral behavior in sport. A total of 1,056 male and female athletes ranging in age from 10 to 18 years completed a questionnaire that contained two hypothetical situations related to moral behavior in sports. Results provided strong support for the theory's proposition that attitudes and subjective norm are direct determinants of behavioral intention. Attitudes proved to be a more important predictor of intention than subjective norm. Results of a confirmatory factor analysis supported a modified version of the theory which added correlations between the attitudinal and normative structures and a causal path from normative beliefs to attitudes.

Godin and Shephard (1986a) examined the influence of selected variables considered external to the theory of reasoned action on exercise intentions of 698 grade 7, 8 and 9 students. The first step of a hierarchical analysis regressing attitude and subjective norm on exercise intentions yielded a significant multiple correlation ($R^2=.337$). Attitude towards the behavior made a significant contribution to the prediction of exercise intention but subjective norm failed to do so. The addition of physical activity habits and external variables including perception of exercise habit, parental exercise behavior, grade, school, gender and prior exercise experience added significantly to the prediction of intention. Two variables, attitude and the combination of habit and prior experience, made significant contribution to the prediction of intention. These findings

revealed that some of the external variables had a direct and independent influence on exercise intentions. The significant contribution of the measures beyond that of the direct measures contradicts predictions based on the theory of reasoned action.

Godin, Colantonio, Davis, Shephard and Simard (1986) used the theory of reasoned action to predict leisure time exercise behavior among 62 lower-limb disabled adults. Whereas intention to exercise ($r=.48$, $p<.001$) was found to be significantly correlated to the actual measure of exercise behavior, neither attitude or subjective norm were found to make a significant contribution to the prediction of behavior or intention. The inclusion of exercise habit was the single variable which carried a significant beta weight ($\beta=.30$, $p<.05$). Significant contributions were made by the interactions of attitude and exercise habit ($\beta=.26$, $p<.05$) and behavioral intention and disability type ($\beta=.28$, $p<.05$). In this study attitude only influenced the intention of those who had a strong habit of exercising and intention improved the prediction of behavior for disabled individuals whose disability was a result of non-traumatic caused. The authors noted the potential for disabled persons to lack volitional control over participatory behavior in leisure time exercise. In addition, the authors identified the need to measure the affective component of the attitudinal measures to improve the predictive ability of the measure.

Valois, Desharnais and Godin (1988) compared the efficacy of the theory of reasoned action with that of Triandis' (1977) theory of interpersonal behavior in the prediction of exercise behavior and intention. The results indicated that each model was efficient in the prediction of behavior. In support of the Triandis model, habit was found to add to the prediction of behavior. In addition, contrary to the theory of reasoned action, the affective component of attitude made a significant contribution beyond intention to the prediction of exercise behavior.

Godin, Valois, Shephard and Desharnais (1987) investigated leisure-time exercise behavior in a random sample of adult university employees. Exercise behavior was measured at two different times following the gathering of exercise intentions. Direct and

indirect measures of both attitude and subjective norm were taken, as well as three measures of exercise habit (immediate, past 4 months and adulthood). Results indicated that intention was directly influenced by attitude and habit. Proximal exercise behavior (three weeks following initial assessment) was related to habit whereas distal exercise behavior (2 months following initial assessment) was explained by a combination of intention and proximal behavior. Subjective norm was not found to be significant in the prediction of intention or either behavior measure.

Riddle (1980) studied 296 joggers and non-exercisers over the age of 30 years using the theory of reasoned action. The results supported the theory. The relationship between intention to jog and jogging behavior was high ($r=.82$) and behavioral intention was predicted from a combination of attitude and normative measures ($R=.742, p<.05$). Attitude ($\beta=.643, p<.05$) made the largest contribution to the prediction with the normative belief measure also making a significant contribution ($\beta=.157, p<.05$). Neither of the direct measures of the theory of reasoned action contributed significantly to the prediction of jogging behavior beyond that of the intention measure. In addition, joggers and non-exercisers could be distinguished at the belief level with joggers holding stronger positive beliefs towards the behavior. The author concluded that educators could develop behavior change strategies by focusing on change of beliefs and attitudes identifiable through the theory of reasoned action.

Schmelling (1985) studied exercise behavior in 135 faculty and staff of a university. Using a 10-point probability scale for intentions to exercise, the author reported a significant positive relationship between behavioral intention and behavior after a one month follow-up. Attitude, but not subjective norm, was found to make a significant contribution to the prediction of intention. A post-hoc comparison of intenders and non-intenders found no significant differences in sex, age, occupation or education between the two classified groups. The two groups did, however, differ significantly at the level of behavioral and outcome beliefs. Intenders held more positive beliefs than did non-intenders.

The previous review lends support to the theory of reasoned action. The studies reviewed fell into three distinct categories. First, there were studies which provided direct support for the theory (e.g., Fishbein et al., 1992; Godin & Shephard, 1986; Loken, 1982; Norman & Tedeshi, 1989; Riddle, 1980; Sheppard, Hartwick & Warshaw, 1988). Second, there were studies in which some of the basic predictions of the theory were not met. These violations usually involved the failure of the direct measures to completely mediate the effects of more distal measures on intention or behavior (e.g., Austin, 1989; Lierman, Young, Kasprzyk & Benoliel, 1990; Toneatto & Binik, 1987). Third, there were studies which added other measures to the theory in an effort to improve prediction and understanding. These additions included knowledge (e.g., DeWeert, Visser, Kok & DerVeen, 1990), and perceived barriers (e.g., Hill, Gardener & Rassaby, 1985). More common was the addition of measures of past behavior (e.g., Budd, North & Spencer, 1984; Theodorakis et al., 1991), habit (e.g., Boyd, Wandersman & Abraham, 1991; Godin & Shephard, 1986; Godin et al., 1986; Godin et al., 1987) and self-efficacy (e.g., Brubaker & Fowler, 1990; Tedesco, Keffer & Fleck-Kandath, 1991). The addition of extra measures to the theory reveals some dissatisfaction on the part of the researchers with the formulation of the theory itself. In response to such concerns, Ajzen (1985, 1988, 1991; Ajzen and Madden, 1986; Ajzen & Driver, 1991, 1992; Schifter & Ajzen, 1985) extended and reformulated the theory of reasoned action and named the reformulation the theory of planned behavior.

2.2 The Theory of Planned Behavior

Ajzen's (Ajzen 1985, 1988, 1991; Ajzen and Madden, 1986; Ajzen & Driver, 1991, 1992; Schifter & Ajzen, 1985) revision of the theory of reasoned action, termed the theory of planned behavior is a relatively recent theoretical addition to the study of attitude-behavior relationships. The revised theory, shown in Figure 2.2, was developed to account for behaviors not completely under volitional control (a requisite assumption used by the theory of reasoned action). Even though many behaviors can be attributed to being under volitional control, Ajzen (1988, 1991) notes that personal deficiencies and external

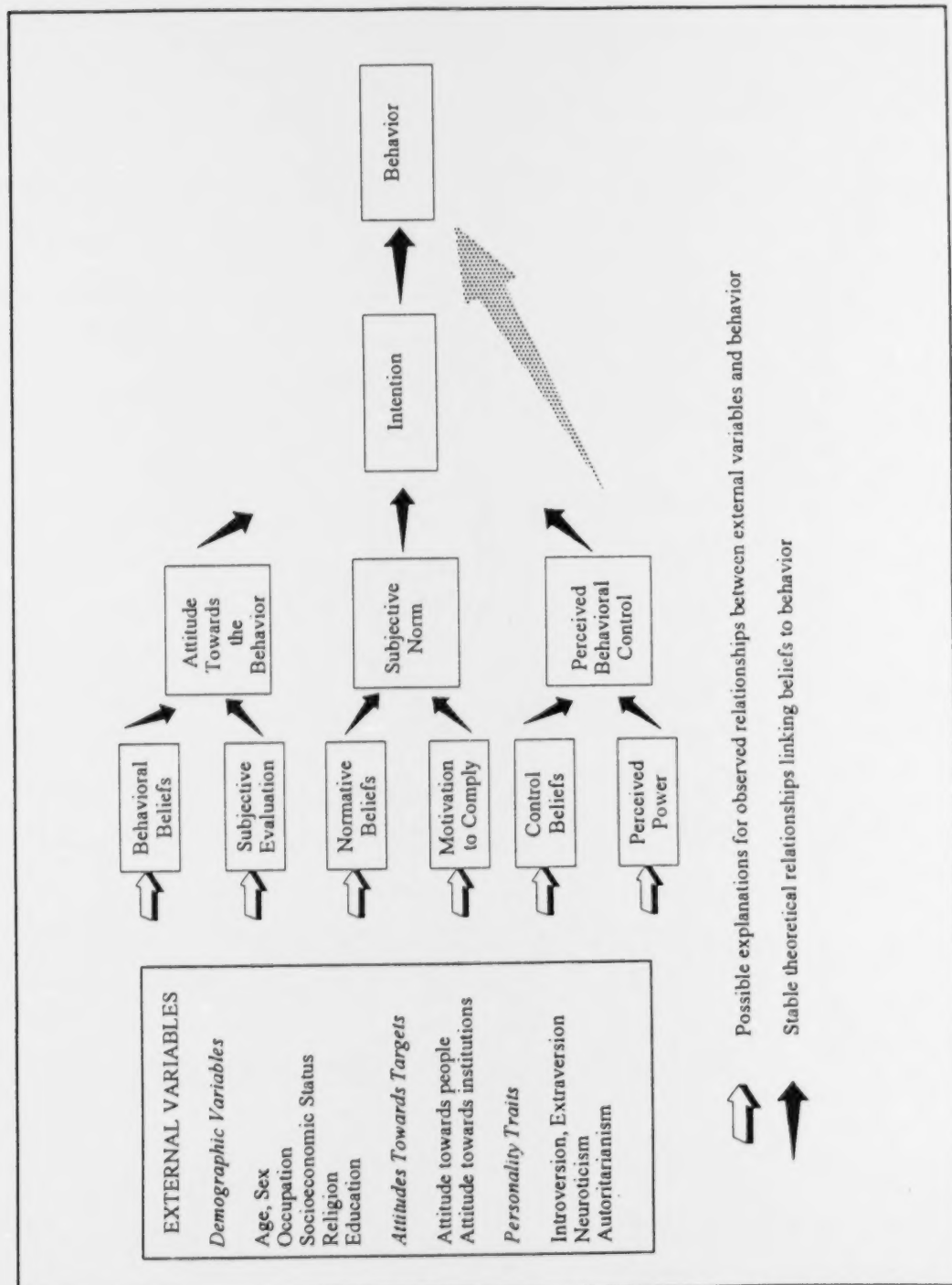


Figure 2.2 Schematic representation of the theory of planned behavior (Adapted from Ajzen, 1989).

obstacles can interfere with the performance of any behavior. In order to account for these potential action limitations, Ajzen has added a measure of *perceived behavioral control* to the theory of reasoned action. Perceived behavioral control, defined as the person's beliefs as to his/her ability to muster the required resources, both internal and external, to carry out the specific behavior, is proposed to effect actual behavior either directly or indirectly.

Ajzen (1991) notes that the conceptualization of perceived behavioral control "is most compatible with Bandura's (1977, 1982) concept of self-efficacy" (p. 184). Ajzen cites the work of Bandura and his colleagues (Bandura, Adams and Beyer, 1977; Bandura, Adams, Hardy and Howells, 1980) as having provided much of the understanding of the workings of the perceived behavioral control measure through their studies of the mechanisms of self-efficacy. These investigations have demonstrated the strong influence of self-efficacy beliefs on subsequent behavior. In reference to the similarity of the concept of self-efficacy and perceived behavioral control, Ajzen concludes that the "theory of planned behavior places the construct of self-efficacy belief or perceived behavioral control within a more general framework of the relations among beliefs, attitudes, intentions and behavior" (p.184).

Like the theory of reasoned action, the theory of planned behavior assumes that behavior is a function of salient beliefs. The theory of reasoned action identifies the weighted influence of behavioral and normative beliefs to be determinants of the direct measures of attitude towards a behavior and subjective norm. The theory of planned behavior assumes that a set of control beliefs underlie the individual's measure of perceived behavioral control. As part of a pilot study carried out by Ajzen and Madden (1986), the belief-based measure of perceived behavioral control was obtained by summing the responses given by students to 10 seven-point scales regarding factors which hindered or assisted in the attendance of college lectures. More recent research (Ajzen & Driver, 1991) and formulation of the construct (Ajzen, 1991) has identified perceived behavioral control to be a function of beliefs. Specifically, "each *control belief* is

multiplied by the *perceived power* of a given control factor to facilitate or inhibit performance of the behavior, and the resulting products are summed across the n salient control beliefs to produce the perception of perceived behavioral control" (Ajzen & Driver, 1991, p.188). Therefore, beliefs regarding the individual's resources and opportunities are seen as a basis of perceived behavioral control.

Ajzen (1991) has discussed the issue of the relatively low magnitude of the relationships reported between direct and indirect measures of the variables in a number of studies based on the theory of reasoned action (e.g. Fishbein and Ajzen, 1981; Godin and Shephard, 1986a; Valiquette, Valois, Desharnais and Godin, 1988). Ajzen addresses two potential methodological items which can influence the relationships at this level. First is the issue of *salient* behavioral beliefs. It is noted that these beliefs must be elicited from the respondents themselves or in pilot work from a sample of respondents which is representative of the study population. Results of empirical investigations which have utilized intuitive or arbitrarily selected sets of belief statements have tended to show weaker correlations with the direct measures than do salient belief sets. Second, Ajzen deals with the issue of scaling of belief and evaluation items. As previously noted most applications of the theory of reasoned action (and subsequently, the theory of planned behavior) have assessed belief strength by means of a 7-point scale. As Ajzen points out, however, there is no distinct guide within either theory as to how these scales should be scored. Often (cf., Fishbein and Ajzen, 1975) in the case of attitudes, belief strength has been scored in a unipolar fashion, whereas evaluations have formed a bipolar continuum. Ajzen (1991, p.193) states "from a measurement perspective . . . either type of scoring could be applied with equal justification." Methodologically, Ajzen suggests the procedure of optimal scaling may be applied post hoc in an effort to strengthen the correlations obtained when investigating the relationships between indirect and direct belief systems. Ajzen and Driver (1991) have shown a moderate improvement in the correlation between global and belief-based measures with the use of optimal scaling.

Initial research on the theory of planned behavior has been supportive of its

predictive ability (Ajzen & Driver, 1991, 1992; Ajzen & Madden, 1986; Gatch & Kendzierski, 1990; Kimiecik, 1992; Shifter & Ajzen, 1985). Research comparing the predictive ability of the theory of planned behavior and Bandura's (1978, 1982) concept of self-efficacy in an exercise context has been conducted (Dzewaltowski 1989; Dzewaltowski, Noble & Shaw, 1990). Although the results have supported the predictive validity of the theory of planned behavior, the measures of self-efficacy were shown to account for more of the behavioral variance within the test populations. The results of these two studies can be questioned on methodological grounds. Ajzen (1985) has noted that the measure of perceived behavioral control is in essence an efficacy measure that extends beyond internal skills and abilities of the person to encompass external factors such as time or money. If the measure of perceived behavioral control in these studies were operationalized in the same fashion as the measures of self-efficacy, the theory of planned behavior could not be less predictive than the self-efficacy measure alone. Had the perceived behavioral control component been measured in the same fashion as self-efficacy, the results would have tested the effects of the addition of the measures of subjective norm and attitude.

The operationalization of the perceived behavioral control and behavioral intention measures of the theory of planned behavior have been central to a number of recent articles (Fishbein & Stasson, 1990; Sheppard, Hartwick & Warshaw, 1988; Warshaw & Davis, 1985). Warshaw and Davis attempt to distinguish between behavioral intention and behavioral expectation developing the position that an intensive measure framed in a self-predictive mode (i.e., I will ...) will lead to greater behavioral prediction than that of an intensive measure operationalized in a motivational tone (i.e., I want ...). In their study of attendance at telephone training sessions Fishbein and Stasson report a contrary result. Attendance was more accurately predicted by a motivational intensive measure (i.e., I want) than by a self-predictive intensive measure (i.e., I will). Fishbein and Stasson found the measure of perceived behavioral control to be more closely related to the measure of self-prediction than to the motivational intensive measure. In light of this finding Fishbein and Stasson conclude that measures of perceived behavioral control may be more

important in the prediction of outcomes (e.g., prediction of course performance, Ajzen & Madden, 1986) than in the prediction of actual behavior (e.g., prediction of class attendance, Ajzen & Madden, 1986).

In their recent research, Ajzen and Driver (1991, 1992) subdivided the indirect behavioral belief measure into affective and instrumental beliefs. Affective beliefs referred to the evaluative measure of the activity along a continuum of enjoyment. Affective beliefs ranged from extreme liking to extreme disliking of a particular behavioral action. For example, an individual may believe running is not enjoyable, thus holding a negative affective belief. Instrumental beliefs were related to the subjective costs and/or benefits of a behavior. The person who holds negative affective beliefs regarding jogging may, for example, hold positive instrumental beliefs regarding the beneficial effects of jogging to personal health. Should the relative contribution of the negative affective belief outweigh that of the positive instrumental belief, the individual would be expected to display an overall negative attitude towards jogging.

The subdivision of behavioral beliefs into affective and instrumental components allows for the study of the effects of these beliefs on training behaviors. Godin (1987) studied the effects of positive affect in the formation of intention to be physically active in a sample of 63 pregnant women using the theory of reasoned action. Attitude was measured using six semantic differential scales which, following a factor analysis with varimax rotation yielded two distinct factors. The first factor corresponded to an affective dimension whereas the second factor was more cognitive in nature and corresponded to the "instrumental" dimension as identified by Ajzen and Driver (1991). Results indicated that the emotional or affective aspect of the subject's attitudes towards exercise following childbirth was the main attitudinal contributor to the prediction of behavioral intention. This study emphasized the importance of the perception of enjoyment or pleasure associated with exercise to the formation of intention.

Enjoyment has been identified as a major contributor to sport commitment by

recent models in the area of sport participation (Schmidt & Stein, 1991; Scanlan, Carpenter, Schmidt, Simons & Keeler, 1993a, 1993b; Carpenter, Scanlan, Simons & Lobel, 1993). Schmidt and Stein's model proposes that enjoyment is the only positive underlying reason for ongoing commitment in sport. Enjoyment-based commitment combines increasing or high rewards with low costs, high satisfaction, low alternatives and high investment to contribute to continued participation. Participants who maintain involvement in the absence of enjoyment are considered to be especially vulnerable to burnout. Individuals who drop-out "will leave sport because of lack of enjoyment" (Schmidt & Stein, 1991, p. 260). Scanlan and colleagues chose enjoyment as a determinant of sport commitment because of its role of "a major attraction variable for athletes" (1993a, p.4). Scanlan et al. (1993a) define sport enjoyment as "*a generalized affective response to the sport experience that reflects generalized feelings such as please, liking, and fun*" (p.6) and is proposed to make a positive contribution to sport commitment. Generalized positive affect, as operationalized as sport satisfaction, enjoyment or fun, has been associated with sport outcome. Game outcome (winning) has been a frequent response of youth sport participants to questions asking what they enjoyed about sport (Fry et al., 1981; Roberts & Duda, 1984; Wankel & Kreisel, 1985). Wankel and Sefton (1989) identified postgame positive affect, how well one played, and challenge as the best predictors of fun as reported by ringette and hockey players over the course of a competitive season. The instrumental measure of beliefs are related to more tangible or productive outcomes of engaging in a specific behavior. These beliefs may be more related to the actual outcome measures or outcome expectancies upon which generalized affect measures associated with overall sport satisfaction, enjoyment, fun, and/or commitment are related.

Although a relatively large body of supportive research has been conducted using the theory of planned behavior and the theory of reasoned action, little attention has been given to the effects of external variables on the relative contributions of the direct and indirect measures to predicting intention and behavior. Godin and Shephard (1986a) used the extended model of the theory of reasoned action to investigate the psychosocial factors

influencing intentions to exercise of grade 7 and 9 students. It was found that current and prior physical activity habits contributed independently to the prediction of exercise intentions. This was contrary to the theoretical prediction that external variables would be mediated through the direct and indirect measures of the theory. Level of education and socio-economic status did not contribute significantly to the prediction of physical activity intention. To date no research has been conducted utilizing psychological measures of individual differences as an external variable within the framework of the theory of planned behavior or theory of reasoned action.

2.2.1 Empirical Research Utilizing the Theory of Planned Behavior

Schifter and Ajzen (1985) provided early support for the theory of planned behavior in their study of weight loss in college women. Results indicated that the three direct measures of the theory of planned behavior made significant independent contributions to the prediction of weight loss intention. Attitude ($\beta=.79$) made the largest contribution to the prediction, followed in magnitude by perceived behavioral control ($\beta=.30$) and subjective norm ($\beta=.17$). In total over 50 % of the variance in the intention to lose weight was accounted for. The importance of the measure of perceived behavioral control was emphasized when the theory was applied to the behavioral measure, weight loss. Weight loss was significantly correlated to perceived behavioral control and intention. Results of a hierarchical multiple regression analysis revealed that perceived behavioral control made the largest contribution to the prediction of actual weight loss ($\beta=.39$) whereas the measure of intention did not contribute significantly to the prediction ($\beta=.09$) indicating a direct effect of the perception of control on behavior. In addition, weight loss was a function of intention and perceived control, showing that a strong intention to lose weight increased weight reduction only for those individuals who believed they had control over the weight loss. Respondents who had a strong weight loss intention, combined with low perceived control showed no resultant weight loss. The authors investigated the effects of general attitudes and personality traits on actual weight loss. Of the different measures that were assessed (ego strength, health locus of control,

action control, and perceived competence), only ego strength was found to have a marginally significant correlation with weight loss ($r=.17$, $p<.07$). Entry of these external variables in combination on the third step of a hierarchical regression analysis significantly improved the prediction of weight loss although none of the variables alone made a significant contribution to the prediction of behavior.

Ajzen and Madden (1986) used two experiments to test the proposed theory of planned behavior. In the first study, the model was used to predict undergraduate student attendance at class lectures over a 6 week period. For the prediction of intentions, attitude and subjective norm were entered on the first step of a hierarchical regression analysis and perceived behavioral control on the second. The measures of attitude ($\beta=.44$) and subjective norm ($\beta=.21$), constituting a test of the theory of reasoned action, both made significant contributions to the prediction of intention. Addition of perceived behavioral control on the second step of the analysis added significantly to the prediction of intention. Final results indicate that the measure of perceived behavioral control ($\beta=.44$) made the largest individual contribution to the prediction of behavioral intent. In total over 45 % of the variance ($R=.68$) in the measure of intention was accounted for by the theory of planned behavior. Intention was found to be significantly related to actual class attendance and the addition of attitude, subjective norm and perceived behavioral control to the predictive equation failed to reliably improve the prediction of actual behavior. The second investigation with the same population tested the predictive validity of the theory for the behavioral goal of obtaining an A in a course. As in the first experiment, the measures of attitude, subjective norm and perceived behavioral control were found to correlate significantly with initial intention to receive an "A" in the class. Results of a hierarchical regression analysis revealed that attitude and perceived behavioral control made significant contributions to the prediction of intentions whereas subjective norm did not. At the beginning of the course the measure of attitude made a larger contribution to the prediction of intention than did perceived behavioral control. A later measure of intention (one closer to the end of the course) revealed that perceived behavioral control made a larger contribution to the prediction of intention. This displayed a relative loss of

perceived control over obtaining an "A" as the term progressed. Intention remained the best predictor of grade attainment at both times. The measures of attitude, subjective norm and perceived behavioral control did not contribute significantly to the prediction of behavior.

Madden, Ellen and Ajzen (1992) compared the theory of planned behavior with the theory of reasoned action for 10 behaviors chosen to represent a range with respect to control over performing the behavior. Two hypotheses were tested. The first was that the addition of perceived behavioral control would significantly enhance the prediction of intentions and target behavior, the second proposed that the magnitude of the prediction of the target behavior would be related to the magnitude of the influence of perceived behavioral control. In other words the ability of the theory of planned behavior to predict behavior would be indirectly related to the amount of volitional control the subject perceived over the target behavior. Both hypotheses were supported by the data. For each of the ten target behaviors, the prediction of intention and behavior was significantly improved by the addition of the measure of perceived behavioral control. In addition, results of path analytic parameter estimates showed that the contribution of perceived behavioral control to the prediction of target behavior varied inversely with the amount of control over behavior. These results were interpreted as providing support for both theories. By assumption, the theory of reasoned action is applicable when behavior is thought to be under volitional control. When, however, the behaviors violate this assumption, the theory of planned behavior proved to provide a better prediction.

2.2.2 Studies Utilizing the Theory of Planned Behavior in Exercise and Physical Activity.

Gatch & Kendzierski (1990) examined the utility of the theory of planned behavior for predicting exercise intentions of 100 undergraduate female aerobic class participants. Measures of attitude towards the behavior, subjective norm and perceived behavioral control were obtained and entered into a hierarchical regression analysis in order to predict

intentions to participate regularly in aerobic classes. The analysis revealed that attitude and subjective norm made a significant contribution to the prediction of intention in a test of the theory of reasoned action. Attitude ($\beta=.39$, $p<.01$) was found to make a larger contribution to the prediction of behavioral intent than did subjective norm ($\beta=.25$, $p<.01$). Addition of perceived behavioral control on the second step of the analysis significantly improved the prediction of intention ($R=.55$, $p<.001$). Attitude ($\beta=.23$, $p<.012$) made the largest relative contribution to the prediction on intention followed in magnitude by perceived behavioral control ($\beta=.25$, $p<.02$) and subjective norm ($\beta=.23$, $p<.02$). Results suggested the theory of planned behavior, assessed by the addition of the measure of perceived behavioral control, provided a superior prediction of exercise intentions than did the theory of reasoned action.

Godin, Valois, Jobin and Ross (1991) used a combination of the theories of planned behavior (Ajzen, 1985) and interpersonal behavior (Triandis, 1977) and protection motivation theory (Rogers, 1983) to predict exercise intentions in 161 cardiac patients. A significant multiple correlation was obtained for the regression for intentions to exercise on the measures of the theory of planned behavior. Attitude ($\beta=.32$) and perceived barriers ($\beta=-.29$) made significant contributions to the prediction whereas subjective norm did not. The addition of the Triandis variables of exercise habit, perceived difficulty and personal normative beliefs significantly increased the amount of variance accounted for in the measure of intentions. The measures of perceived difficulty ($\beta=.24$) and exercise habit ($\beta=.28$) made significant contributions to the prediction, however the measure of personal normative beliefs ($\beta=.12$) did not. Addition of the Rogers variables failed to reliably improve the prediction of exercise intention. The operationalization of the measures of perceived barriers within the theory of planned behavior was conducted in such a way that the measures of behavioral control and perceived difficulty could be summed to form the overall measure of behavioral control, but for purposes of this study they were not. When this is taken into account, the results indicate that the addition of habit from the Triandis model was the only measure which appreciably improved the prediction of intention.

In a study of the determinants of exercise intention of 444 employees of an electric power commission, Godin & Gionet (1991) found that over 40 % of the variance in the intensive measure was explained by a combination of variables from the theories of reasoned action (Fishbein & Ajzen, 1975), planned behavior (Ajzen, 1985), and interpersonal behavior (Triandis, 1977). Results showed that employees intentions to exercise during the next six month period was explained by the measures of attitude ($\beta=.21$), perceived barriers ($\beta=.28$), and exercise habit ($\beta=.44$). These results are similar to those reported by other studies conducted among various sub-groups of the general population. Other external variables including age, gender and fitness category failed to contribute to the equation.

Wankel, Mummery, Stephens and Craig (1994) tested the relative utility of the theory of reasoned action and theory of planned behavior for the prediction of physical activity intention in the Canadian population. Utilizing secondary data analysis of the 1988 Campbell's Survey of Well-Being direct measures of attitude, subjective norm (operationalized as social support), and perceived behavioral control were assessed. In addition, indirect measures of behavioral and control beliefs and external measures of age, gender, and income were examined. Results revealed that the measures of attitude, subjective norm, and perceived behavioral control were significantly related to exercise intention. Entry of the measures of attitude and subjective norm on the first step of a hierarchical regression analysis accounted for a significant portion of the variance in the measure of intention ($R^2_{\text{adjusted}}=.31$). Both the direct measure of attitude ($\beta=.36$, $p<.001$) and subjective norm ($\beta=.25$, $p<.001$) made a significant contribution to the measure of intention. Consistent with the theory of planned behavior, the addition of perceived behavioral control significantly improved the predictions of intentions. Following the addition of the three measures the most significant contributor to the prediction of intention was perceived behavioral control ($\beta=.39$, $p<.001$) followed by attitude ($\beta=.28$, $p<.001$) and subjective norm ($\beta=.18$, $p<.001$). Addition of the indirect belief measures and external factors failed to reliably improve the prediction of the dependent measure. Subsequent analysis of age and gender subsamples revealed differing

relative contributions of the direct measures across different sub-groups. Specifically, the relative contribution of perceived behavioral control and subjective norm increased across age groupings with a related decrease in the magnitude of the attitudinal measure indicating a decrease in the amount of volitional control over exercise behavior held by individuals of advancing years.

The studies reviewed to this point have investigated the ability of selected measures of the theory of planned behavior to predict exercise intentions. The studies by Wankel, Mummery, Craig, & Stephens (1994) and Gatch and Kendzierski (1991) utilized the measure of perceived behavioral control in the prediction of intention, whereas the studies by Godin (Godin & Gionet, 1991; Godin, Valois, Jobin and Ross, 1991) utilized measures of perceived barriers. In each case the selected control measure made a significant contribution to the prediction of exercise. Godin, Valois and Lepage (1993) studied the pattern of influence of perceived behavioral control on exercise intention and behavior in two studies using members of the general population and a group of pregnant women. Results from the general population indicated that perceived behavioral control influenced behavior only through intention, whereas none of the variables from the theory of planned behavior were associated to exercise behavior in the group of pregnant women. For both groups intention to exercise was influenced by attitude and perceived behavioral control. Subjective norm did not make a significant contribution to the prediction of intention for either study. In addition a measure of exercise habit was found to influence behavior for both study groups. The authors concluded that since perceived behavioral control failed to directly influence behavior in either study group, exercise behavior is therefore under volitional control. In addition, it was concluded that perceived behavioral control contributes to the understanding of intentions to exercise.

Dzewaltowski, Noble and Shaw (1990) examined the abilities of Bandura's (1977, 1988) social cognitive theory and the theories of reasoned action and planned behavior to predict physical activity participation among undergraduate students. Entry of the measures of attitude and subjective norm on the first step of a regression analysis yielded

a significant prediction of physical activity intentions ($R=.43$, $p<.05$). The measure of attitude ($\beta=.40$, $p<.05$) made a significant contribution to the prediction whereas the measure of subjective norm ($\beta=.06$, ns) did not. Addition of the measure of perceived behavioral control on the next step of the analysis significantly improved the prediction of physical activity intention ($R=.52$, $p<.05$). After the three direct measures of the theory of planned behavior had been entered, attitude ($\beta=.33$, $p<.05$) and perceived behavioral control ($\beta=.30$, $p<.05$) made significant contributions to the prediction whereas subjective norm ($\beta=.04$, ns) did not. Addition of a measure of past physical activity behavior did not change the results. The ability of the social cognitive constructs to predict physical activity participation was examined using multiple regression. The measures of self-efficacy ($\beta=.23$, $p<.05$) and self-evaluation ($\beta=-.21$, $p<.05$) were found to make significant contributions to the prediction of behavior. When comparison was made between the theories, self-efficacy proved to make a larger contribution to the prediction of behavior than did intention or perceived behavioral control. The authors report, "it is clear that self-efficacy and perceived behavioral control, as operationally defined in this study, are not similar constructs " (p.398.). As previously noted, Ajzen (1991, p.184) views the conceptualization of perceived behavioral control to be "compatible with Bandura's (1978, 1982) concept of self-efficacy". Thus, the reported lack of construct compatibility from Dziewaltowski, Noble and Shaw's research may simply be related to the authors operationalization of the two constructs.

Yordy and Lent (1993), using measures similar to Dziewaltowski (Dziewaltowski, 1989; Dziewaltowski, Noble & Shaw, 1990), compared the abilities of the theories of reasoned action, planned behavior and the social cognitive theory of Bandura (1986, 1989) to predict exercise behavior in a sample of 284 undergraduate students. Results suggest that the reasoned action model was a robust predictor of exercise intentions ($R=.76$, $p<.01$). The measures of attitude ($r=.51$, $p<.001$), subjective norm ($r=.42$, $p<.001$), and perceived behavioral control ($r=.12$, $p<.01$) were significantly related to behavioral intention. Addition of the measures of perceived behavioral control failed to increase the ability of the model to predict exercise intentions ($R^2_{\text{change}}=.00$, ns). The inability for

the measure of perceived behavioral control to add to the variance accounted for in the measure of intention fails to support the predictions made by the theory of planned behavior, and would imply that the exercise behavior was completely under volitional control. A significant discriminant function was produced with intention, self-efficacy, and outcome beliefs each making significant contributions to the function. Only perceived behavioral control failed to make a significant contribution to the prediction. Results of this research, which utilized measures similar to Dzewaltowski, Noble and Shaw's (1990), should be interpreted with similar qualification. The finding that self-efficacy and perceived behavioral control were not similar constructs may reflect a difference at the level of operationalization.

Kimiecik (1992) compared the theories of reasoned action and planned behavior in the prediction of exercise intentions and behavior in corporate employees. To examine the relative utility of the two models, two hierarchical regression analyses were conducted, one to predict intention, the second to predict behavior. Results indicated that subjective norm failed to make a reliable contribution to the prediction of intention or behavior at any level. The addition of perceived behavioral control significantly improved the prediction of exercise intention thus providing support for the theory of planned behavior. Attitude towards exercise made the largest relative contribution to the prediction of intention ($\beta=.53$) followed by perceived behavioral control ($\beta=.35$). In addition, the interaction between attitude and behavioral control made a significant contribution ($\beta=.18$) to the intensive prediction. Intention proved to be the most reliable predictor of behavior. No significant change in the amount of variance in the behavioral measure was obtained by subsequent addition of other measures of the theory. The author concluded that the results provide support for the theory of planned behavior, suggesting that an individual's perceptions of control are important determinants of intention formation and subsequent behavior.

Ajzen and Driver (1992) examined the usefulness of the theory of planned behavior in predicting intentions and behavior of college students' participation in five

leisure time activities. Measures of intention, attitude, subjective norm and perceived behavioral control were obtained for going to the beach, jogging, mountain climbing, boating and biking. One year later the participatory behaviors of the respondents was assessed. Intention was significantly related to behavior for all five activities. Addition of the measure of perceived behavioral control on the second step of a hierarchical regression analysis reliably improved the prediction of behavior for spending time at the beach ($\beta=.45, p<.01$), mountain climbing ($\beta=.31, p<.01$) and boating ($\beta=.47, p<.01$), but not for jogging ($\beta=.17, ns$) or biking ($\beta=.06, ns$). These findings were interpreted as indicating spending time at the beach, mountain climbing and boating were not completely under the volitional control of the individual whereas jogging and biking were evidenced to be under volitional control. The addition of attitude failed to significantly improve the amount of variance accounted for in any of the five activities. Subjective norm made a significant contribution to the prediction of behavior for jogging ($\beta=.22, p<.01$), and mountain climbing ($\beta=.45, p<.01$). Ajzen and Driver split the attitudinal measure into affective and instrumental components in order to investigate the relative utility of each component in the prediction of intention. Affective measures made significant contributions to the prediction of intentions to go to the beach ($\beta=.25, p<.05$), jogging ($\beta=.14, p<.05$) and biking ($\beta=.42, p<.01$), whereas instrumental attitude measures were significant only in the prediction of jogging intention ($\beta=.14, p<.05$). Perceived behavioral control made a significant contribution to the prediction of intention for each behavior (β range .29 to .52, median = .44). Previous activity involvement failed to affect the accuracy of prediction for behavior or intention.

In summary, numerous studies over a wide range of behaviors have provided support for the utility of theory of planned behavior for predicting behavioral intention and subsequent behavior. In the area of physical activity, the addition of the measure of perceived behavioral control consistently improved the prediction of behavioral intention. Only the study conducted by Yordy and Lent (1993) failed to show an appreciable improvement in the predictive ability of the theory of planned behavior over its predecessor, the theory of reasoned action. This reflects the perceptions of the subjects

involved in their study that exercise was largely within their control. This may be a factor of the demographics of the study sample. Given that the sample was a young, highly educated group this may indeed increase the perception of control over the behavior in question. Research by Wankel, Mummery, Stephens and Craig (1994) indicates that this age-group displayed the lowest (although significant) contribution of behavioral control to the prediction of exercise intention, with the magnitude of the contribution increasing significantly across the age groups studied. In general, the studies reviewed found attitude consistently made the largest contribution to the prediction of leisure time physical activity. This would be expected as the attitudinal beliefs would contribute greatly to the type of leisure time activities chosen. In addition the measure of subjective norm consistently made the smallest contribution to the prediction of intention. The measure failed to make the largest contribution to the prediction of intention in any of the reviewed studies. The recent work by Ajzen and Driver (1991) in which the attitudinal component was divided into instrumental and affective attitudinal components allows for the examination of the relative contribution made by each measure of attitude to the prediction of intention and behavior.

2.3 Competence Motivation

A large body of information has been collected regarding participatory behavior in sport and physical activity. In much of this work however, participation has been measured as a dichotomous participation/non-participation variable. The present research can be viewed as a type of participatory research investigating a continuum of effortful preparatory participation. If training behavior is viewed as a continuum of participation some valuable insights into the motivated behavior of the participants may be drawn from the available body of participatory research.

Early empirical studies regarding participation motivation have accumulated a base of descriptive information regarding motives for participation (e.g., Fry, McClements & Sefton, 1981; Gill, Gross & Huddleston, 1983; Gould, Feltz & Weiss, 1985; State of

Michigan Youth Sport Institute Studies, 1976, 1978a, 1978b; Orlick, 1973, 1974; Sefton & Fry, 1981). As Gould (1982) points out this body of descriptive work has largely been conducted without the foundation of a theoretical framework. Over the past decade the focus has switched from descriptive research to studies which are conceptually based. One theoretical avenue which has provided a framework for a number of participatory studies (Burton and Martens, 1986; Feltz, Gould, Horn & Weiss, 1982; Feltz & Petlichkoff, 1983; Klint & Weiss, 1987; Roberts, Klieber & Duda, 1981; Weiss, Bredemeier & Shewchuk, 1985) is Harter's (1978, 1981) competence motivation theory. Harter's theoretical orientation draws heavily on the earlier work of White (1959).

In the classic paper *Motivation Reconsidered: The Concept of Competence*, Robert White (1959) directs his discontent with psychoanalytic instinct theory of Freud and the drive reduction theory of Hull by reconceptualizing the concept of motivation. Drawing from a diverse set of findings in human and animal psychology White argues that competence is a motivational concept; "that there is a competence motivation as well as competence in its familiar sense of achieved capacity ... it is directed, selective and persistent, and ... it satisfies an intrinsic need to deal with the environment" (p. 318).

Susan Harter (1978) refines and extends White's (1959) theory of effectance motivation in an attempt to describe the motivational forces that cause an individual to act with the intent of dealing effectively with his/her surroundings. White's original model of effectance motivation was founded on the assumption that behaviors such as exploration, curiosity, mastery, and play could not be accounted for by traditional drive theories of motivation. He believed these behaviors evidenced the organism's natural tendency to try to deal competently with its environment. Success in these mastery attempts lead to a perception of competence which give rise to feelings of efficacy and inherent pleasure. These feelings increase or maintain effectance motivation which subsequently effect the likelihood of further mastery attempts by the organism on its environment.

In order to overcome the 'globalness' of White's omnibus theory Harter chooses four motivational domains which operate within the developing child. These domains are similar to ones identified, but undeveloped, by White in his initial treatise on the subject. These four domains include: (i) response variation, in which the individual displays variation in actions simply to deviate from a routine of 'sameness', (ii) curiosity for novel stimuli, in which the developing child's exploratory behavior is rooted in the need for curiosity and stimulation in his/her stimulus field, (iii) mastery for the sake of competence, where the child must not only interact with the environment in novel and stimulating ways, but must do so competently for the sole reward of being involved in those attempts, (iv) preference for challenging tasks, where, in the course of mastery and interaction of the environment, the child will attain most pleasure, and most internal reinforcement from tasks that provide an optimal challenge for his/her developing abilities.

Harter provides evidence for a hierarchical development of the four motivational domains. The behavioral display of the motive force differentiates developmentally. A 4 year-old may interact with a task simply for reasons of novelty, whereas a 10 year-old may be drawn to the same task by a need to successfully master it. As Harter notes the "structure and content of effectance motivation changes developmentally" (1978, p. 41).

Instead of viewing competence as a unitary construct, Harter (1978) emphasizes specific skill areas within which one can assess the child's perception of competence. Three specific domains have been identified; social (peer relations), cognitive (academic accomplishments) and physical (athletic prowess). In the development of a more recent measurement instrument, Harter (1981, 1982) has included a fourth, independent subscale of general self-worth.

Harter (1978) examines the effects of both success and failure on the individual. Noting White's (1959) original model dealt only with success Harter has added a failure dimension to her model of effectance motivation. Success is not the basic prerequisite for the development of the effectance motive for as Harter states "the focal question

concerns the relative balance of success and failure to produce a basically intrinsically versus a basically extrinsically orientated person" (1978, p. 43). Successful mastery attempts lead to the development of an intrinsically orientated person through the construction of an internal self-reward system based on mastery goals. Repeated failure can develop a person with an extrinsic orientation, one who is dependent on external goals and social approval. The extrinsically orientated individual lacks perceived competence and experiences anxiety in mastery situations.

The perception of, and gratification from, successful performances is however, mediated by the amount of challenge perceived by the participant. Tasks within one's capacities produce maximum pleasure if they provide an optimal level of challenge. This level of challenge prescribes an 'inverted U' relationship between task difficulty (within the bounds of ability) and pleasure.

Harter views reward and reinforcement as critical part of the social environment of the developing child. Rewards are viewed as having both motivational and informational functions. The motivational function of reward operates at both an incentive (anticipative) and affective (satisfactive) level. The informational component of reward can provide specific evaluative information regarding the relative success and failure of one's performance and general information which defines potentially important behaviors and outcomes. There is proposed 'ontogenetic' change in the ideal development of the child's reward system with a developmental shift from extrinsic reward and social reinforcement to an internalization of a self-reward system. This gradual, developmental shift from extrinsic to intrinsic rewards takes place only if the child has perceived positive outcomes in various attempts at mastering the domain (i.e., displaying physical prowess). Lack of reinforcement for independent attempts to master the specific domain, combined with reinforcement for dependence on adults, leads the young child to a dependence on external approval. This need can persist, or increase developmentally, in the failure situation leading to anxiety and decreased effectance motivation. The result of decreased effectance motivation is the avoidance of mastery attempts within the given domain.

Harter (1978) states "with sufficient positive reinforcement for independent mastery attempts during childhood, the child gradually internalizes two critical systems, a self-reward system and a system of standards or mastery goals" (p. 50).

Through a history of differential reinforcement and observational learning the individual can become intrinsically motivated. Socializing agents, secondary reinforcement and modelling of approval all play influential parts in the development of the internal self-reward system. Harter suggests that the intrinsically motivated individual is someone who exists on a relatively thin slice of external reward and reinforcement. This individual only occasionally requires information as to the goodness of one's internal standards and the level of one's perceived competence.

Harter views intrinsic motivation as being developed from two sources; the first the biologically innate need for competence which drives the individual towards effective interactions with the environment, the second an ontogenetic, or developmental, internalization of the mastery goals and self-reward systems.

2.3.1 Research Utilizing Competence Motivation Theory in Sport and Physical Activity

One of the earliest studies utilizing Harter's work was conducted by Roberts, Kleiber and Duda (1981). A total of 143 male and female fourth and fifth grade students were administered Harter's perceived competence scales and were interviewed to determine their involvement in organized youth sport activities. Results indicated that sport participants were reliably higher in perceived physical competence than non-participants. The correlational nature of the study limited the ability of the researchers to attribute sport participation as the causative factor increasing perceived competence. A study of the relationship of length of sport involvement and perceived competence failed to resolve the question leaving the authors to concede that sport may select out those who perceive themselves as more competent to begin with rather than contributing in a substantial way to the measures of competence. Further analysis of general causal

attributions of the subjects revealed that sport participants had higher future expectations of success and higher levels of persistence than did non-participants. In summary, the authors report the findings support the contention that perceived competence has an important relationship to participation in youth sport participation.

Horn (1985) studied the relationship between junior high school softball coaches' feedback and changes in their female athletes' self-perceptions. Results indicated that a significant portion of the variance in the players' psychosocial growth was a function of both the players' demonstrated sport competence and the behaviors of their coach in response to their skill performance. In addition coaches' practice behaviors were significantly associated with changes in players' self-perceptions, but their game behaviors were not. Although skill competence was the largest contributor, certain coaching behaviors were also influential in explaining changes in players' perceptions of competence.

Kimiecik, Allison, and Duda (1986) studied the subjective interpretations of competitive sport outcomes in children. Performance satisfaction of the adolescent boys was significantly related to personal perceived competence. This finding was independent of game outcome, both winners and losers displayed performance satisfaction as long as they had perceived physical competence.

Brustad and Weiss (1987) explored the relationship between the cognitive appraisal processes and the affective characteristics of youth sport involvement. The authors report that boys displaying high competitive trait anxiety reported lower levels of self-esteem and more frequent worries about their performance than did their less anxious counterparts. For the girls, no significant relationships were found between levels of competitive trait anxiety and the cognitive variables.

Klint and Weiss (1987) examined the proposition, based on Harter's (1978) competence motivation theory, that perceptions of competence are related to particular

motives children have for sport participation. Children high in perceived physical competence were found to be more motivated by skill development reasons, while gymnasts high in perceived social competence were more motivated by the affiliation aspects of sport.

Feltz and Petlichkoff (1983) utilized Harter's model of competence motivation in order to study the relationship between perceived competence and length of involvement in sport. Adolescent participants and dropouts were assessed using Harter (1979) perceived competence scale for children. Results showed a significant but low relation between length of participation and perceived physical competence. The authors also reported participants as having significantly higher perceived physical competence than dropouts, and males to be significantly higher in perceived physical competence than females.

In order to compare young soccer players' general self-esteem, perceived physical competence and perceived soccer competence with actual soccer ability Feltz and Brown (1984) modified selected subscales of Harter's (1979) perceived competence skills for children. The modified scales displayed high internal consistency with the perceived soccer skill measure proving to be the best predictor of actual soccer skills. The relationship indicated that the domain specific measure, while more accurate than global style measures, still could not relate to the actual skill as well as a sport-specific subscale. This would strengthen the belief that intermediary measures are in play in the competence-behavior relationship as measured by Harter's scales.

Hopper, Guthrie and Kelly (1991) examined multi-dimensional self-concept and skill development changes in adolescent soccer players following participation in a soccer camp. Subjects were pre- and post-tested on four 4 skill tests, Harter's Self-Perception Profile for Children and a soccer self-concept scale. Significant improvements were found on one skill item, the physical appearance scale of Harter's scale, and on the soccer self-concept scale. The authors concluded that the significant improvement in the soccer self-

concept supported the multidimensional theory of self-concept. In addition comparisons of players' perceptions of ability and coaches' ratings indicated that older players (aged 11-14 years) and coaches agreed more on ability than did younger players (aged 8-10 years) and coaches.

Weiss and Duncan (1992) studied the relationship between competence in physical skills and interpersonal competence with peers in a sport setting. Participating children completed measures assessing perceptions of physical competence and peer acceptance, perceptions of success for athletic performance and interpersonal skills, causal attributions for physical performance and interpersonal success, and expectations for future success in these two areas. Results displayed a significant multivariate correlation between the physical competence and peer acceptance variables. The authors suggest that these results indicate that children's beliefs about athletic ability are strongly related to actual and perceived acceptance by the peer group. Results showed that actual and perceived indicators of physical competence and peer acceptance contributed most to this relationship.

Crocker and Ellsworth (1990) analyzed the reliability and validity of selected scales of Neumann and Harter's (1986) Self-Perception Profile for College Students. The authors hypothesized that students enrolled in physical education would display higher perceptions of athletic competence than would the general student population. Results were found to support the hypothesis. In addition the scales were found to be internally consistent and there was factorial validity for the competence scales. Data also showed that males had higher perceptions of athletic competence and physical appearance with females displaying higher measures of perceived social acceptance.

Weiss, McAuley, Ebbeck and Wiese (1990) explored the relationship between children's self-esteem and attributions for performance in both physical and social achievement domains. Participants' physical and social self-esteem were measured using Harter's (1982) perceived competence scale for children. In addition, subjects' perceptions

of, and attributions for, performance and interpersonal success in a summer sports program were assessed. Results displayed a significant relationship between physical and social self-concepts and causal attributions. The authors report that subjects displaying high physical self-concept made attributions that were more internal, stable, and higher in personal control than did individuals displaying low physical self-concept. For social competence, high competent subjects made attributions that were more internal, stable, and higher in personal and lower in external control than did subjects displaying low perceived social competence. The authors conclude that the findings of this study support a self-consistency approach to self-perception.

2.4 Summary and Conclusions from Review of Literature

The literature reviewed supported the general utility of the theory of reasoned action for the prediction of behavior and intention (cf., Sheppard, Hartwick & Warshaw, 1988). There have, however, been numerous attempts to increase the predictive ability of the theory by the addition of various measures including behavioral knowledge (DeWeert, Visser, Kok & DerVeen, 1990), and self-efficacy (Brubaker & Fowler, 1990; Tedesco, Keffer & Fleck-Kandath, 1991), perceived barriers (Hill, Gardener & Rassaby, 1985), behavior habit/past behavior (Budd, North & Spencer, 1984; Godin, Colantonio, Davis, Shephard & Simard, 1986; Godin & Shephard, 1986a, Valois, Desharnais & Godin, 1988; Theodorakis, Doganis, Bagiatis & Gouthas, 1991). Due to concerns over the apparent inability of the theory of reasoned action to adequately predict behaviors not completely under volitional control, Ajzen (1985, 1988, 1991) reformulated and extended the theory by the addition of the efficacious measure of perceived behavioral control. Early research utilizing the theory of planned behavior has lent support to its predictive ability (Schifter & Ajzen, 1985; Ajzen & Madden, 1986). Specifically, the addition of perceived behavioral control has been shown to increase the predictive ability of the theory of planned behavior when target behaviors are not completely under volitional control (Ajzen & Driver, 1991, 1992; Madden, Ellen & Ajzen, 1992). Recent work by Ajzen and Driver (1991, 1992) indicates that the separation of affective and instrumental beliefs may

provide a richer description of the study of the decisional processes involved in the formation of intention. Research displaying the importance of positive affect in the formation of physical activity intention (Godin, 1987) and the role of enjoyment in the formation of sporting commitment (Schmidt & Stein, 1991; Carpenter, Scanlan, Simons & Lobel, 1993; Scanlan, Carpenter, Schmidt & Keeler, 1993a, 1993b) display the need to study the relative contributions of affective and instrumental attitudes to the predictions of training intention and behavior.

Numerous studies have demonstrated measures of perceived competence to be at the foundation of many behaviors or behavioral dispositions. The validity of the domain specific measures operationalized in Harter's self-perception profiles has been supported by a wide range of studies crossing many different groups within the overall population. Relationships between perceived competence and sport participation (Roberts, Kleiber & Duda, 1981) and motives for participation (Klint & Weiss, 1987) have been reported. In general however these relationships have been weak. Insight into the relations between overall aggregate measures of self-perception and actual behavior in sport are offered by the theory of planned behavior (see figure 2.2) which describes the possible relationships linking these measures to actual behavior. Participatory research using Harter's framework in the area of youth sport has operationalized both commitment and persistence in a dichotomous manner. Participation has often been assessed as simply yes or no. Within the sport context there remains a need to study and understand the determinants of persistence and commitment within the sport. Athletes who are committed to a training program and those who persist at it are more likely to achieve a higher relative level of success, especially in a quantitative, time-measured sport such as competitive swimming.

The review of literature has revealed no previous research using the proposed theoretical frameworks in the area of training adherence or compliance. It is hoped that through applying appropriate social psychological models, the current research will provide more insight in the areas of commitment, persistence and participation in competitive youth sport.

CHAPTER III

METHODS AND PROCEDURES

3.1 Study Design

The study used an extended version of the theory of planned behavior. The collection of the data followed the procedures recommended by Ajzen and Fishbein (1980). This included a pilot study with a sample similar to the final sample, and the main study. The entire model of the theory of planned behavior as operationalized in this study is presented in Figure 3.1. The principal dependent variable is training behavior. Training, defined as the frequency, volume and intensity of work performed, was measured using multiple indicators of behavior. Objective measures of attendance and meters completed were obtained for each participant in the study. In addition, subjective measures of training behavior were obtained by a swimmer self-report and coaching report of the individual's frequency, volume, intensity and overall compliance in the assigned training.

A total of seventeen variables are involved in the multiple regression analyses in this research model. This does not include the affective and instrumental sub-sets of the direct and indirect measures of attitude which will be used for separate subsequent analyses. The total list of variables involved in the analysis are listed below.

Dependent Variable:

- | | |
|---------|-----------------------------------|
| Level I | 1. Training Behavior (4 measures) |
|---------|-----------------------------------|

Intervening Variables:

- | | |
|------------|--------------------------------------|
| Level II: | 2. Behavioral Intention |
| Level III: | 3. Attitude Toward Behavior |
| | 3a. Affective Attitude |
| | 3b. Instrumental Attitude |
| | 4. Subjective Norm |
| | 5. Perceived Behavioral Control |
| Level IV: | 6. Belief Based Measures of Attitude |

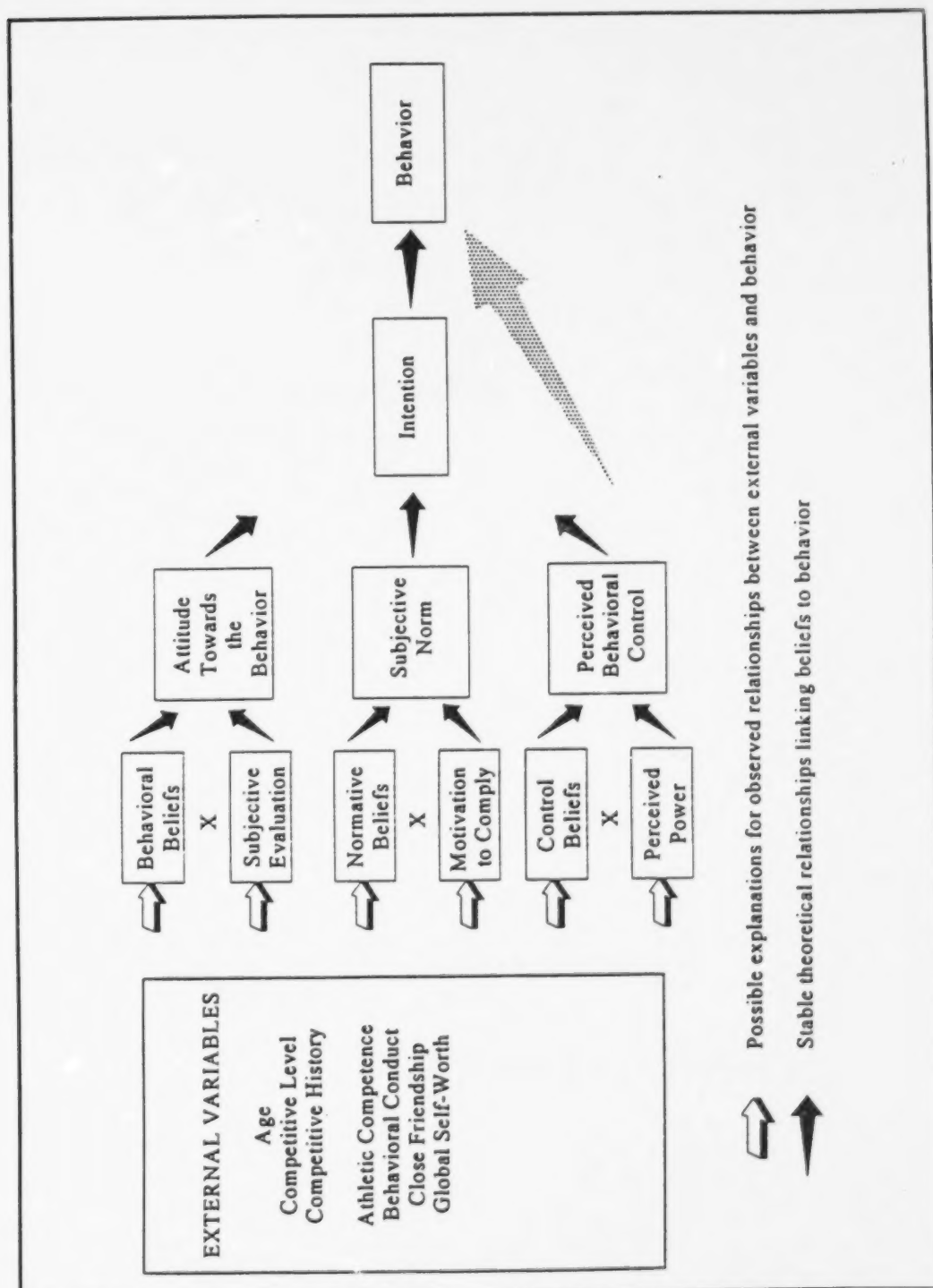


Figure 3.1 Operationalization of the theory of planned behavior

7. Belief-Based Measures of Subjective Norm
8. Belief-Based Measures of Perceived Behavioral Control

Independent Variables:

- Level V
9. Age
 10. Sex
 11. Competitive Level
 12. Athletic Competence
 13. Behavioral Conduct
 14. Close Friendship
 15. Global Self-Worth

3.2 Pilot Study

3.2.1 Pilot Study Sample

The sample for the pilot study consisted of 24 twelve- to eighteen-year-old advanced age-group competitive swimmers involved in a swimming development camp in the city of Edmonton, Alberta. The 15 males and 9 females, ranging in age from 13 to 17 years, came from swim clubs from across the province of Alberta. The average age of the male participants was 14.7 years, and the average age of the females participants was 14.4 years.

3.2.2 Measuring Instruments

Instrumental beliefs: Participants were instructed to list any benefits or gains which they could think of as resulting from the completion of the frequency, volume, and intensity of their assigned training. Each question was followed by several blank lines, and the participants were asked to list all relevant benefits or gains associated with the completion of the frequency, volume and intensity of training. Additionally, on the lower half of the same page, the participants were asked to list the costs or drawbacks which could result from the completion of the frequency, volume and/or intensity of the training assigned by their coach.

Affective beliefs: To obtain the affective beliefs from the study population, the participants were asked to list anything that they liked or enjoyed about completing the frequency, volume and intensity of the assigned training. To identify potential negative affective beliefs, respondents were asked to list as many things as they could think of that they disliked, or hated about the completion of assigned training.

Normative referents: In order to identify the referents for normative beliefs the participants were asked to list as many individuals as they could think of who approved of them completing their assigned training, and those who disapproved of them completing their training as prescribed.

Control beliefs: To identify control beliefs, pilot study participants were asked to provide open-ended responses to two questions. The first question asked the participants to identify anything that could help or assist them in their plans to complete the assigned training. The second question asked them to identify anything that would interfere or hurt their ability to complete the training as assigned.

A copy of the entire pilot study questionnaire can be found in Appendix A, page 129.

3.2.3 Procedure for Analyzing the Data

The responses provided by the participants were content analyzed. Similar responses were grouped together and the most frequently mentioned items were retained for use in the main study.

3.3 Main Study

3.3.1 Study Sample

The population for the main study consisted of age-group adolescent competitive swimmers currently participating in competitive swimming in a registered Canadian swim club. The sample for the study was selected from the overall population on the basis of a number of criteria. The swimmers must have been in a heavy phase of training in a program offering a minimum of six training sessions per week. In addition, the participants involved in the study must have been training under the direct supervision of the coach contacted to take part in the study. This allowed for sufficient briefing and debriefing of the participating club as the principal researcher was not always able to be present during the administration of the questionnaires.

Initial contact was made in writing with 36 Canadian swim clubs asking for their assistance in the collection of the required data. A total of 19 club coaches returned the initial invitation to participate. Of the responding coaches, 2 indicated that they were not interested in participating in the study, 1 responded that his club members failed to reach the training criteria outlined, and 1 displayed interest in the study but could not commit to participation until the following season. Following the return of the agreement to participate, 15 club coaches were contacted and sent the questionnaire/response packages and informed consent letters. As 2 clubs were located in the same immediate geographical area of the principal researcher, direct contact was made with these clubs for data collection. In total 11 swim clubs from 5 Canadian provinces returned the completed questionnaire packages. This resulted in a total of 169 swimmers aged 11 through 18 years, with a mean age of 14.6 years. The sample consisted of 81 males and 88 females. Over half (62.3%) of the sample competed at the provincial level of competition. A total of 29.7% of the study sample competed at the senior or youth national level of competition. Although the sample was not randomly drawn from the entire Canadian swimming population, and therefore generalizations of the results must be limited, the

sample is considered to be reflective of the adolescent competitive swimmer in medium sized Canadian swimming clubs.

3.3.2 Measuring Instruments

Data was collected through the use of four separate questionnaires. Three of the questionnaires were given to the participating athletes and one to the coach of the participating athletes. The first two questionnaires given to the participating swimmers gathered information needed for the operationalization of the theory of planned behavior. The first questionnaire gathered information regarding the swimmers age, competitive level, competitive history and gender. In addition, the indirect measures of the theory were gathered in this initial questionnaire. The second questionnaire gathered data regarding the swimmer's intention to participate in the frequency, volume and intensity of training during the upcoming study period. The information relevant to the selected domains of Harter's (1988) self-perception scale for adolescents was also included with this portion of the questionnaire. The third part of the data collection was done at the completion of the study period, with the swimmer completing self-report measures regarding his or her training behavior during the study period. At this time the coach completed a questionnaire assessing the coach's perception of the athletes training behavior, recording individual training attendance, training volume and competitive level. Each variable was measured on only one occasion thus raising the question of temporal stability of the measures. There exists evidence that , although test-retest reliability can be ensured by measuring the constructs on more than one occasion, measurement on only one occasion is sufficient to ensure high levels of reliability (Valois, Godin & Bertrand, 1992). Although it would have been desirable to establish test-retest reliability it was not possible to access each population for re-testing prior to the onset of the training cycles.

3.3.3 External Measures

Age: Age, in years, was gathered from the participants. Respondents ranged in age

from 11 to 18 years with a mean age of 14.6 ($SD=1.7$) years.

Gender. The study sample consisted of 81 males (48%) and 88 females (52%).

Competitive Level: Information regarding the competitive level was obtained from the participating athlete's coach. Participants were categorized by the highest level at which they were currently competing. Five levels of classification were used; club, provincial, youth/eastern/western championship, senior national, or international level. The majority of participants were competing at the provincial (62.3%) and youth/eastern/western championship (20.3%) level. The remainder of the respondents competed at the local (8.0%) or senior national (9.4%) level. No participants were competing at the international level at the time of the study.

Career Length: Information about the number of years of participation in the sport of competitive swimming was collected from the individual participants in response to the question; "how many years have you swam for a competitive swimming club?". Participants ranged in career lengths from one to thirteen years with a mean career length of 5.6 ($SD=2.3$) years.

Perceived Competence: Perceived competence was measured in a domain specific fashion. The instrument used to obtain these measures was the Adolescent Self-Perception Profile (ASSP; Harter, 1988). Recent research with other related scales has been conducted using only selected domains from the overall profile (Roberts, Klieber & Duda, 1981; Harter & Connell, 1984; Weiss, McAuley, Ebbeck & Weise, 1990). Information regarding four of the profile's nine domains was obtained for this research. Overall questionnaire length, number of independent variables and relationship to the dependent measure guided selection of domains. Domain measures of athletic competence, behavioral conduct, close friendships and global self-worth were included in the questionnaire.

Athletic Competence: This subscale taps the adolescent's perceptions of his or her athletic ability and competence at sport (e.g., feelings that he/she is good at sports and athletic activities). Five four-point items, presented in the second participant questionnaire, were used to obtain data regarding the individual's perceived athletic competence. Subsequent analysis revealed an alpha reliability coefficient of .78.

Behavioral Conduct: This subscale taps the degree to which one likes the way one behaves, does the right thing, acts the way one is supposed to, and avoids getting into trouble. Five four-point items, presented in the second participant questionnaire, were used to obtain data regarding the individual's perceived behavioral conduct. The alpha reliability coefficient obtained for the measure of behavioral conduct was .72.

Close Friendship: This subscale taps one's ability to make close friends that one can share personal thoughts and secrets with. Five four-point items, presented in the second participant questionnaire, were used to obtain data regarding the individual's measure of close friendship. Subsequent analysis revealed an alpha reliability coefficient of .84.

Global Self-Worth: This item taps the extent to which the adolescent likes oneself as a person, is happy with the way one is leading one's life, and is generally happy with the way one is. Thus it constitutes a global judgement of one's worth as a person, rather than a measure of domain-specific competence or adequacy. Five four-point items, presented in the second participant questionnaire, were used to obtain data regarding the individual's perception of his or her global self-worth. The alpha reliability coefficient obtained for this measure was .77.

A list of perceived competence items, grouped by domain is presented in Appendix B, page 140.

3.3.4 Indirect Measures of the Theory of Planned Behavior.

The questions used for the investigation of the indirect beliefs were obtained from the pilot work as recommended by Ajzen and Fishbein (1980). These beliefs were compiled from the open-ended questionnaires used in the pilot study. Responses were content analyzed with similar responses being grouped together. The most frequently cited beliefs were retained for inclusion in the main study (Ajzen & Driver, 1991).

Belief-Based Measure of Attitude: In accordance with the expectancy value model of attitude (see Fishbein & Ajzen, 1975), the strength of each behavioral belief (b) was combined in multiplicative fashion with its corresponding subjective evaluation (e), and the resulting products were summed over the 25 belief items developed from the pilot study. The individual's belief-based measures of attitude are theorized to be directly proportional to the summative belief index (Fishbein & Ajzen, 1975; Ajzen & Driver, 1991). The expectancy-value formulation of the individual's belief-based measures of attitude are depicted in Equation 1.

$$A = \sum_{i=1}^n b_i e_i \quad [\text{Equation 1}]$$

The belief-based measures of attitude developed from the pilot study included 25 behavioral beliefs and 25 corresponding subjective evaluations. Each measure was scored on a seven-point Likert type scale indicating the degree to which the participants agreed or disagreed with each belief and evaluative statement. Following summation of the products of the measures, an internal consistency (α) of .89 was obtained for the belief-based measure of attitude. The behavioral belief measures can be found in Appendix C, Part A, questions 1.1 to 1.25 on pages 147 to 149. The related subjective evaluation questions can be seen in Appendix C, Part A, questions 4.1 to 4.25 on pages 152 and 153.

Belief-based Measure of Subjective Norm: The belief-based measure of subjective norm was obtained in a fashion similar to that for the belief-based measure of attitude.

The summation of the product of the individual's normative beliefs (n) and his or her corresponding motivation to comply (mc) formed the belief-based measure of subjective norm (see equation 2).

$$SN = \sum_{i=1}^n n_i mc_i \quad [\text{Equation 2}]$$

The use of the normative belief and corresponding motivation to comply measures developed from the pilot study resulted in the use of 11 pairs of normative measures. Each measure was scored on a seven-point Likert type scale indicating the degree to which the athlete agreed or disagreed with each normative belief and motivation to comply statement. Following the summation of the products of the measures an internal consistency (α) of .89 was obtained for the belief-based measure of subjective norm. The normative belief measures can be found in Appendix C, Part A, questions 2.1 to 2.11 on pages 149 and 150. The related motivation to comply questions can be seen in Appendix C, Part A, questions 5.1 to 5.11 on pages 153 and 154.

Belief-Based Measure of Perceived Behavioral Control: The pilot study identified 23 control beliefs which were developed into 23 pairs of control belief questions. The belief-based measure of perceived behavioral control was obtained in an expectancy-value formulation similar to the belief-based measures of attitude and subjective norm. The belief-based measure of perceived behavioral control was obtained by summing the product of the control beliefs (c) and perceived power (pp) over the 11 pairs of control question (see equation 3).

$$PBC = \sum_{i=1}^n c_i pp_i \quad [\text{Equation 3}]$$

Each measure was scored on a seven-point Likert type scale indicating the degree to which the participants agreed or disagreed with the belief and evaluative statements. Following the summation of the products of the measures, the internal consistency (α) of the belief-based measure of perceived behavioral control was found to be .64. The

control belief measures can be found in Appendix C, Part A, questions 3.1 to 3.23 on pages 150 and 151. The related perceived power questions can be seen in Appendix C, Part A, questions 6.1 to 6.23 on pages 154 and 155.

3.3.5 Direct Measures of the Theory of Planned Behavior.

The direct measures of the theory of planned behavior include attitude towards the behavior, subjective norm, and perceived behavioral control. The measures have been constructed utilizing the guidelines as outlined by Ajzen (Ajzen & Fishbein, 1980; Ajzen & Driver, 1991, 1992).

Attitude towards the behavior: The attitude measure was assessed by asking the athletes to rate their beliefs about training on a set of 12, 7-point semantic differential scale items. The overall attitude towards the behavior measure, assessed using the sum of the 12 items, had a mean of 66.30 ($SD=9.62$) with an internal consistency (α) of .83. The attitude measures can be found in Appendix C, Part B, question 15 on page 163. The overall scale was conceptualized as containing six adjective pairs of an instrumental tone (e.g., important/unimportant, beneficial/harmful) and six pairs of an affective tone (e.g., boring/fun, pleasant/unpleasant). This process was the same as the one utilized by Ajzen and Driver (1991, 1992) in using affective and instrumental attitudes in the prediction of leisure behaviors. This allowed for the investigation of the relative contribution of the affective and instrumental attitude measures to the prediction of intention and behavior. In addition, affective and instrumental measures could be separately entered as dependent measures when studying the effects of the external and indirect measures of the theory. Results of principal component factor analysis with orthogonal rotations yielded a two-factor structure which differed slightly from the a priori hypothesized structure. As a result of the factor analysis, a six item instrumental attitude measure was constructed using six items which loaded on one of the two identified factors. The resultant six item scale had a mean of 37.70 ($SD=4.59$) and a reliability coefficient (α) of .85. The affective attitude scale, reconstructed following factor analysis, consisted of five measures.

The mean of this scale was 28.64 ($SD=6.51$) with an alpha internal consistency (α) of .79. One item (detrimental/constructive) which failed to load at a .40 level on either factor was removed from subsequent analysis. Results of the principal component analysis are displayed in Table 3.1.

Subjective Norm. Subjective norm was assessed by obtaining the sum of five, seven point, Likert type scales assessing the normative beliefs of the subjects. The mean of this scale was 27.86 ($SD=5.30$) with an internal consistency (α) of .79. The subjective norm measures can be found in Appendix C, Part B, questions 4, 7, 8, 11, and 13 on pages 162 and 163.

Perceived Behavioral Control. The measure of perceived behavioral control was obtained by summing five, seven-point, Likert type questions assessing respondents assessment of control over training behavior during the study period. The mean of this scale was 28.29 (± 5.17) with an internal consistency (α) of .76. The perceived behavioral control measures can be found in Appendix C, Part B, questions 2, 5, 6, 9 and, 10 on pages 162 and 163.

3.3.6 Behavioral Intention

According to the theory of reasoned action (Fishbein & Ajzen, 1975), and the theory of planned behavior (Ajzen, 1985, 1987), behavioral intention is the best predictor of subsequent behavior. In this study behavioral intention was measured by means of four, seven-point, Likert type questions directed at assessing the athlete's intentions to complete the frequency, volume and intensity of training during the study period. The questions were posed in a form similar to "I plan to following the assigned training during the next three weeks". The sum of the four intention measures formed the overall measure. The mean of the intention measure was 24.14 ($SD=4.04$) with an internal consistency (α) of .84. The behavioral intention measures can be found in Appendix C, Part B, questions 1, 3, 12 and, 14 on pages 162 and 163.

Table 3.1

Principal component analysis of direct attitudinal measures with varimax rotation

Variable	Factor I Instrumental Attitude	Factor II Affective Attitude
Unimportant - Important	.65	.11
Useless - Useful	.72	.00
Harmful - Beneficial	.71	.14
Worthless - Valuable	.85	.07
Bad - Good	.76	.27
Unproductive - Productive	.76	.30
Dull - Exciting	.20	.67
Painful - Enjoyable	-.14	.68
Unpleasant - Pleasant	.15	.79
Aggravating - Satisfying	.28	.61
Boring - Fun	.18	.85
Detrimental - Constructive	.34	.38

3.3.7 Training Measures

A total of four training measures were used to assess training behavior. Two objective measures were used to assess training frequency and volume and two subjective measures, swimmer self-report and coach-report, were used to assess behavior. The subjective measures of behavior were similar to the intention questions in terms of frequency, volume and intensity of training. Each of the two subjective measures was assessed using four, seven point Likert type questions. The swimmer self-report of behavior had a mean response of 21.87 ($SD=4.86$) with an internal consistency (α) of .80, and the coach-report a mean of 21.90 ($SD=\pm 4.15$) with an internal consistency (α) of .89. A copy of the swimmers' final report is presented in Appendix D, page 164, and a copy of the coaches' final report is presented in Appendix E, page 166.

The means and internal consistency measures for the items used in this research are summarized in Table 3.2.

3.4 Data Analysis

Statistical analyses were conducted using results from all respondents. In addition to descriptive analyses data was treated in the following ways:

1. A hierarchical regression analysis¹ analysis was used to predict the four measures of training behavior from intention, and from a combination of intention and perceived behavioral control. This analysis was used to investigate the direct effects of perceived behavioral control on behavior as proposed by the theory of planned behavior.

¹The terminology "hierarchical regression analysis" has consistently been used in the literature dealing with the theories of reasoned action/planned behavior to describe a forced entry step-wise regression analysis. In order to remain consistent with this terminology, hierarchical regression analysis will be used to refer to forced entry step-wise regression analyses in this paper.

2. A hierarchical regression analysis was used to predict behavior from intention, attitude towards the behavior, subjective norm, perceived behavioral control, belief-based measures of attitude, subjective norm, and perceived behavioral and, the external variables of age, gender, competitive level, athletic competence, behavioral conduct, close friendship and global self-worth.
3. A hierarchical regression analysis was used to predict intention from attitude towards the behavior, subjective norm, perceived behavioral control, belief-based measures of attitude, subjective norm, and perceived behavioral control and, the external variables.
4. A hierarchical regression analysis was used to predict attitude towards the behavior from belief-based measures of attitude, subjective norm and perceived behavioral control and, the external variables.
5. A hierarchical regression analysis was used to predict subjective norm from a combination of belief-based measures of attitude, subjective norm and perceived behavioral control and, the external variables.
6. A hierarchical regression analysis was used to predict perceived behavioral control from a combination of belief-based measures of attitude, subjective norm and perceived behavioral control and, the external variables.
7. A multiple regression analysis was used to predict the belief-based measure of attitude control from the external variables.
8. A multiple regression analysis was used to predict the belief-based measure of subjective norm from the external variables.
9. A multiple regression analysis was used to predict the belief-based measure of

Table 3.2

Means and internal consistency (α) measures of questionnaire items

Scale	# Items	Range	Mean (S.D.)	α
<i>Training Measures</i>				
Swimmer report	4	4-28	21.87(4.86)	.80
Coach report	4	4-28	21.90(4.15)	.89
Intention	4	4-28	24.14(4.04)	.84
<i>Direct Measures</i>				
Attitude	12	12-84	66.30(9.62)	.83
Affective Component	5	5-35	28.64(6.51)	.79
Instrumental Component	6	6-42	37.70(4.59)	.85
Subjective Norm	5	5-35	27.86(5.30)	.79
Perceived Behavioral Control	5	5-35	28.29(5.17)	.76
<i>Indirect Measures</i>				
Behavioral Beliefs	25	25-1225	808.47(143.29)	.91
Normative Beliefs	11	11-539	218.18(78.73)	.82
Control Beliefs	23	23-1127	438.03(63.22)	.52
<i>External Measures</i>				
Behavioral Conduct	5	5-20	14.87(2.81)	.72
Close Friendships	5	5-20	16.07(3.55)	.84
Athletic Competence	5	5-20	15.56(2.82)	.78
Global Self Worth	5	5-20	15.40(2.87)	.78

perceived behavioral control from the external variables.

In order to investigate the relative effects of the affective and instrumental measures of attitudes and belief-based measures the following hierarchical analyses were conducted:

1. A hierarchical regression analysis was used to predict behavior from intention, affective attitude towards the behavior, instrumental attitude towards the behavior, subjective norm, and perceived behavioral control, belief-based measure of attitude, subjective norm and perceived behavioral and, the external variables of age, gender, competitive level, athletic competence, behavioral conduct, close friendship and global self-worth.
2. A hierarchical regression analysis was used to predict intention from affective attitude towards the behavior, instrumental attitude towards the behavior, subjective norm and perceived behavioral control, belief-based measure of attitude, subjective norm and perceived behavioral control and, the external variables.
3. A hierarchical regression analysis was used to predict affective attitude towards the behavior from belief-based measures of attitude, subjective norm and perceived behavioral control and, the external variables.
4. A hierarchical regression analysis was used to predict instrumental attitude towards the behavior from belief-based measures of attitude, subjective norm and perceived behavioral control and, the external variables.

Comparison between the theory of planned behavior and the theory of reasoned action was made by assessing the incremental F ratio (F_{inc}) obtained after the addition of the measure of perceived behavioral control to the regression analysis. The equation, as cited by Tabachnick and Fidell (1989), used for this comparison was as follows :

$$F_{inc} = ((R^2_{tpb} - R^2_{tra}) / (df_{tpb} - df_{tra})) / ((1 - R^2_{tpb}) / (N - df_{tpb} - 1))$$

tpb=theory of planned behavior; tra=theory of reasoned action

CHAPTER IV

RESULTS AND DISCUSSION

4.1 PILOT STUDY

The results of the pilot study were utilized to construct the measurement instrument used in the main body of this research. The responses to the four categories of questions; affective behavioral beliefs, instrumental behavioral beliefs, normative beliefs and control beliefs, described the views the pilot study participants held regarding training. Open-ended questions were asked in each of the four conceptualized domains (Ajzen & Driver, 1991). Results of each of the four conceptually defined domains are reported separately.

4.1.1 Behavioral Beliefs

A total of four questions were posed to elicit responses to the two behavioral belief domains. Positive and negative affective and instrumental belief questions were developed in a manner similar to Ajzen and Driver (1991, 1992). Responses to each domain are presented separately.

4.1.1.1 Affective Behavioral Beliefs

Two questions were asked in order to obtain salient affective behavioral beliefs from the pilot population. The first affective question asked respondents to list as many items as they could think of that they *liked* or *enjoyed* about training in the sport of competitive swimming. A total of 55 responses were given by the participants. These responses were reduced to 18 different response categories. One-third of the subjects (33.3%) reported that they liked or enjoyed achieving a sense of accomplishment which could result from completing training. This was closely followed by improved performance associated with the completion of training, with 29.2% of the subjects

reporting this belief. Over 20% of the sample reported liking a sense of self-fulfilment which resulted from the completion of training (20.8%).

In response to the negative affective behavioral belief question more than forty percent (41.6%) of pilot study participants reported disliking or hating failing or not performing in training. Over thirty-five percent (37.5%) of the respondents reported that they disliked the pain associated with the completion of training (20% of the total responses), while one-third of the respondents (33.3%) disliked the fatigue brought on as result of training (17.7% of the total responses). Loss of time for other activities was also cited by one-third (33%) of the participants as something they disliked or hated about completing their training. Less than ten percent (8.3%) of the respondents identified boredom as a negative factor.

4.1.1.2 Instrumental Behavioral Beliefs

The positive instrumental belief question elicited a total of 82 open-ended responses from the pilot study participants. These responses were classified into 25 different response categories. One-half of the participants identified increased performance as a benefit or gain from the completion of training in the sport of competitive swimming. Nearly forty percent of the study participants (38.7%) identified increased conditioning and achieving a sense of accomplishment as benefit responses.

In response to the question asking for negative instrumental behavioral beliefs, one-half of the subjects reported fatigue as a cost or drawback of the completion of assigned training. Over one-third (37.5%) noted an increased risk of injury as a drawback, whereas 20.5% of the subjects reported a loss of time for other activities and pain as a cost of training completion. Additionally, 16.6% of the respondents noted stress resulting from the completion of training as one of the drawbacks to training adherence.

Analysis of the affective and instrumental categories shows substantial similarities

in responses across conceptually different domains. All of the affective measures were reported at least once in response to the instrumental question. This response redundancy is evidence that the participants did not substantially differentiate between the affective and instrumental domains as presented in this study. Table 4.1 displays a summary of the affective and behavioral belief responses which made up the final questionnaire. It can be noted that achieving a sense of accomplishment and improving performance as a result of training were considered to be both a benefit/gain and something the participants liked/enjoyed. The finding that the respondents did not substantially differentiate between affective and instrumental domains may be viewed as being consistent with some of the research reviewed in the area of sport enjoyment. Generalized measures of affect in sport have been associated with positive outcome measures by a number of researchers (Fry et al., 1981; Roberts & Duda, 1984; Wankel & Kreisel, 1985; Wankel & Sefton, 1989). The lack of distinction made by the swimmers at the belief level between instrumental (benefits or gains) and affective beliefs (like or enjoy) may be due to the strong relationship between outcome and affect in this population. The qualitative nature of the pilot study analyses precludes the researcher from inferring differences between affective and instrumental beliefs at this level. As a result separate affective and instrumental questions were not included at the level of belief-based measure of attitude on the final questionnaire used in the main study.

4.1.2 Normative Beliefs

Two questions were asked of the pilot study subjects regarding the positive and negative normative beliefs that they held regarding training for competitive swimming. An open-ended question asked the subjects to report who approved of them completing their training. A total of 75 responses were provided by the subjects. These responses were classified into 12 different normative beliefs. Over 70% of the subjects reported that their parents approved of them completing their training. Nearly 70% reported the approval of their coach in the completion of training (66.7%). In addition almost one-half of the sample identified friends as approving of the completion of training.

Table 4.1

Summary of Behavioral Belief Responses ($N=24$)

beliefs (percentage of respondents)	Affective Beliefs	Instrumental Beliefs
Achieve a sense of accomplishment	8 (33.3%)	9 (38.7%)
Improve performance	7 (29.2%)	12 (50.0%)
Meet new people	3 (12.5%)	3 (12.5%)
Accept new challenges	3 (12.5%)	1 (4.2%)
Receive compliments	2 (8.3%)	1 (4.2%)
Gain respect from others	3 (12.5%)	3 (12.5%)
Increase conditioning	4 (16.7%)	9 (38.7%)
Improve health	-	4 (16.7%)
Increase confidence	1 (4.2%)	4 (16.7%)
Improve self-image	4 (16.7%)	1 (4.2%)
Increase mental toughness	2 (8.3%)	3 (12.5%)
Increase travel opportunities	2 (8.3%)	3 (12.5%)
Have fun	3 (12.5%)	1 (4.2%)
Reduce stress	-	1 (4.2%)
Gain rewards	-	2 (8.3%)
Improve competitive ranking	3 (12.5%)	4 (16.7%)
Achieve a sense of self-fulfilment	5 (20.8%)	4 (16.7%)
Improve race strategy	-	1 (4.2%)
Become more competitive	-	3 (12.5%)
Increase pain tolerance	1 (4.2%)	2 (8.3%)
Keep busy	1 (4.2%)	3 (12.5%)
Improve attitude	-	4 (16.7%)
Achieve competitive goals	2 (8.3%)	2 (8.3%)
Push myself	1 (4.2%)	1 (4.2%)
Increase popularity	-	1 (4.2%)

In response to the question asking who disapproved of the subject's training completion, pilot study participants advanced a total of thirty total responses which fell into seven distinct classes. Teachers (29.1%) and competitors (25.0%) were the most frequently cited individuals which disapproved of the subject completing assigned training. It is worth noting the number of responses which were classified under both positive and negative beliefs. Parents, friends and teachers were reported as both approving and disapproving of adherence to a prescribed training program. It is apparent that the effects of the normative measure will not provide much insight until developed into an expectancy-value measure as prescribed by the theory of planned behavior. Only at this time can the strength of the normative belief be measured. When combined with the motivation to comply with the normative group or individual it will become possible to study the relationship of the normative belief to the direct measures of the theory and behavior itself.

Two of the response categories did not conform to the normative definition of Ajzen and Fishbein (1975). These included the subject him/herself approving and no-one disapproving. In order to avoid confusion during the final testing these items were omitted from the final instrument. For the test questionnaire the parental and family category was divided into mother/father and sister/brother, and friends was divided into friends on the team and friends not on the team. These changes were done to clearly identify the normative referents to the final sample respondents. A summary of the normative belief responses is presented in Table 4.2

4.1.3 Control Beliefs

Two questions were asked of the pilot study participants to identify positive and negative control beliefs. Respondents were asked what *helped* or *assisted* them in the completion of training in an effort to gather positive control beliefs. Negative control beliefs were obtained in response to the question "*what interferes or hurts the completion of training*". A total of 106 control belief items were received in response to the two

Table 4.2

Summary of Normative Belief Responses ($N=24$)

beliefs (percentage of respondents)	Approves	Disapproves
Teammates	6 (25.0%)	-
Father	1 (4.2%)	-
Mother	1 (4.2%)	-
Grandparents	2 (8.4%)	-
Teachers	1 (4.2%)	7 (29.1%)
Friends on team	1 (4.2%)	-
Friends not on team	-	1 (4.2%)
Brothers/sisters	1 (4.2%)	-
Boyfriend/girlfriend	-	1 (4.2%)
Competitors	-	6 (25.0%)
Coach	16 (66.7%)	-
Parents	17 (70.8%)	3 (12.5%)
Friends	11 (45.8%)	5 (20.8%)
Family	3 (12.5%)	-
Yourself	11 (45.8%)	-
No one	-	5 (20.8%)

n.b. shaded responses not included on final test instrument

questions, 46 positive control belief responses and 60 negative control belief responses.

The 46 total responses to the positive control belief question were categorized into 11 response categories. The most frequently reported item which helped or assisted the swimmers in the completion of training was the support of the coach (37.5%). A positive attitude (29.1%) and self-motivation (25.0%) were also frequently cited items which helped in the completion of training. In response to the question regarding what *interferes or hurts* the completion of assigned training, over one-third (37.5%) of the pilot study participants identified school commitments. Nearly thirty percent of the respondents reported that friends interfered with the completion of training (29.1%), and one-quarter of the sample identified being tired/fatigued, lack of motivation, and a negative attitude interfered with the completion of training. A summary of the control belief responses as used in the final questionnaire is displayed in table 4.3

The pilot study provided separate and distinct answers in the positive and negative control belief categories. Little of the redundancy of responses displayed in the positive and negative normative area was displayed. Only peer pressure was cited as both assisting and interfering with training. This indicates that the participants were able to clearly differentiate between the conceptualized domains identified by the measuring instrument. There was, however, a conceptual similarity in responses from the control belief domain to the normative belief domain. The high frequency of social support responses (i.e., support from parents, friends, coaches, teammates) may be conceptually linked to the normative belief response. Previous research using the theory of reasoned action (DeWeer et. al. 1990) and the theory of planned behavior (Wankel, Mummery, Stephens, & Craig, 1994) has used a social support measure as the operationalized measure of subjective norm. The result of this qualitative finding is of interest when one notes previous research utilizing the theory of reasoned action (see Sheppard, Hartwick & Warshaw, 1988), and the theory of planned behavior (see Dzewaltowski, Nobel & Shaw, 1991) which has consistently reported the normative measure to contribute relatively little to the prediction of behavioral intention. It may be possible that the relatively low contribution of

Table 4.3

Summary of Control Belief Responses (*N*=24)

beliefs (percentage of respondents)	Helps or Assists	Interferes or Hurts
Good nutrition	5 (20.8%)	-
Support from parents	2 (8.3%)	-
Support from friends	4 (16.7%)	-
Support from coaches	9 (37.5%)	-
Support from teammates	4 (16.7%)	-
Proper sleep	4 (16.7%)	-
Self-motivation	6 (25.0%)	-
Positive attitude	7 (29.1%)	-
Competition in training	2 (8.3%)	-
Lack of ability	-	1 (4.2%)
School commitments	-	9 (37.5%)
Peer pressure	2 (8.3%)	3 (12.5%)
Tired/fatigue	-	6 (25.0%)
Injury	-	7 (29.1%)
Illness	-	4 (16.7%)
Social life	-	3 (12.5%)
Poor nutrition	-	2 (8.3%)
Lack of sleep	-	4 (16.7%)
Friends	-	7 (19.1%)
Lack of motivation	-	6 (25.0%)
Negative attitude	-	6 (25.0%)
Ability	1 (4.2%)	-
Worry/stress	-	2 (8.3%)

subjective norm to the prediction of behavioral intention may be related to a somewhat restricted definition of subjective norm and normative beliefs. The operationalization of subjective norm, as prescribed by the theory of reasoned action and theory of planned behavior may fail to capture the contribution of social support. Additionally, friends and peer pressure were items cited as negatively influencing the completion of training in both control and normative belief categories. Injuries, illness and fatigue were cited as negative influences on training in both attitudinal and control belief domains.

As a result of the information gathered from the pilot study the indirect measures of the main study questionnaire were developed (see Appendix B). The paired behavioral beliefs and outcome evaluation items of the expectancy-value measure consisted of twenty-five matched pair questions. As a result of failure of the pilot study to distinguish between the affective and instrumental behavioral belief domains, only one list of questions relating to the belief-based measures of attitudes was constructed.

The normative belief items and the corresponding motivation to comply questions were similarly developed from the information elicited from the pilot work. A total of eleven matched-pair questions, which constituted the expectancy-value measure for the normative belief indirect measure of the theory of reasoned action/theory of planned behavior, were constructed.

Belief-based perceived behavioral control items for the main study were again derived from the work completed in the pilot research. A total of twenty-five matched pair control belief/perceived power items were formed in order to study the effects of the beliefs in the main body of the research.

4.2 MAIN STUDY

4.2.1 Descriptive Results

A total of nineteen variables were examined in this study. Subsequent analysis of separate affective and instrumental attitude scales obtained from a division of the overall attitude measure raised the number of variables to twenty. The descriptive results are presented in Table 4.4.

Four training measures were obtained. Overall the participants in this study reported a high degree of adherence to the training assigned during the course of the research. Both the swimmer self-report and coach report displayed a mean value of 5.47 on a seven point scale. According to the attendance report completed by the coach the swimmers in the study attended almost ninety percent of the assigned training (89%). In addition, the swimmers completed 86% of the assigned training meters during the course of the study.

Overall, the swimmers in the present study displayed a high degree of intention to complete the assigned frequency, volume and intensity of training during the course of the study. The mean intention measure was 6.04 on a seven-point intention scale.

Descriptive results indicated that, on average, the participating swimmers held a positive attitude towards training (5.53 out of 7.00), felt that important others desired the completion of training (subjective norm 5.57 out of 7.00) and believed that they had the internal and external resources to complete the assigned training (perceived behavioral control 5.67 out of 7.00).

Examination of the mean scores for the affective (4.77 out of 7.00) and instrumental (6.28 out of 7.00) division of attitude towards training indicates that the swimmers, on average, felt that the completion of the frequency, volume and intensity of

Table 4.4

Descriptive measures of training measures, intention, direct, indirect and external measures of the theory of planned behavior.

	Valid Cases	Missing	Mean	Std.Dev	Min.	Max.
Training Measures						
Swimmer Report	120	50	5.47	1.22	1.00	7.00
Coach Report	135	35	5.47	1.04	2.75	7.00
Attendance	136	34	0.89	0.11	0.50	1.00
Volume	136	34	0.86	0.12	0.54	1.00
Intention	155	15	6.04	0.08	2.00	7.00
Direct Measures						
Attitude	153	17	5.53	0.70	1.92	6.92
Affective Attitude	153	17	4.77	1.09	1.00	7.00
Instrumental Attitude	155	15	6.28	0.76	2.83	7.00
Subjective Norm	155	15	5.57	1.06	2.20	7.00
Perceived Behavioral Control	152	18	5.67	1.04	1.80	7.00
Indirect Measures						
Behavioral Beliefs	156	14	808.47	143.29	249.00	1108.00
Normative Beliefs	153	17	218.18	78.73	72.00	444.00
Control Beliefs	153	17	438.03	63.22	276.00	602.00
External Measures						
Age	169	1	14.59	1.67	11.00	18.00
Competitive Level	138	32	2.31	0.75	1.00	4.00
Career Length	168	2	5.61	2.33	1.00	13.00
Athletic Competence	149	21	15.56	2.82	7.00	20.00
Behavioral Conduct	147	23	14.87	2.81	6.00	20.00
Close Friendship	150	20	16.07	3.55	6.00	20.00
Global Self Worth	149	21	15.40	2.87	6.00	20.00

assigned training was more beneficial than enjoyable.

4.2.2 Data Transformations

Prior to analysis the variables were examined through various SPSS-PC programs for accuracy of data entry, missing values, skewness and kurtosis. One case was found to be a significant univariate outlier ($p < .001$) with extremely low z scores on the behavioral belief measure. SPSS-PC REGRESSION was used to look for multivariate outliers for each analysis. Using Mahalanobis distance with $p < .005$, the same case¹ was identified as a multivariate outlier and was removed from each of the four analyses for the training behavior measures. Numerous variables displayed significant ($p < .001$) negative skewness and kurtosis. To reduce the extreme skewness and kurtosis the swimmer's self-report of training was logarithmically transformed. The measure of training intention was logarithmically transformed along with the direct measures of attitude toward the behavior, subjective norm, and perceived behavioral control; the direct measure of instrumental attitude; and external measures of close friendship obtained from Harter's Self Perception Profile. In addition, the external measure of global self-worth, which displayed positive skewness, was improved by taking the square root of the measure. Examination of the residuals of each separate analysis indicated that assumptions of normality, linearity and homoscedasticity were met. No subsequent data transformations were made.

4.2.3 Prediction of Training Behaviors

Due to the return of a number of incomplete surveys several separate analyses were conducted in an effort to maximize the number (n) in each sub-sample. The first series of analyses were conducted in order to test the hypothesis that there was a

¹ Case #114 was a twelve year old boy who trained thirteen hours per week and competed at a provincial level. This individual reported extremely unfavourable scores on the three direct measure of the theory of planned behavior.

significant and substantial relationship between the individual's behavioral intention and subsequent behavior. Each of the four training behavior measures were separately analyzed using hierarchical regression analysis and are presented separately.

The study assessed four different measures of training behavior in the adolescent athlete using SPSS-PC CORRELATIONS. The correlations between self-report, coach report, attendance training intention and the three direct measures of the theory of planned behavior are displayed in Table 4.5. Of greatest interest is the relationship between the measure of behavioral intention and the training measures of swimmer self-report, coach-report, training volume and training attendance. In each case a significant correlation between intention and training behavior was found. The strongest relationship was noted between behavioral intention and the swimmer's self-report ($r=.42$, $p<.001$). Intention was also significantly related to training attendance ($r=.35$, $p<.001$), coach report ($r=.30$, $p<.01$), and training volume ($r=.30$, $p<.01$).

An examination of the relationships between the selected training measures revealed significant correlations between all four variables. The swimmer's self-report was significantly but not substantially related to the other three measures of training behavior. The lowest magnitude of correlation was between the coach's report of training behavior and that of the swimmer's self-report ($r=.28$, $p<.01$). The highest correlation was between training attendance and training volume ($r=.90$, $p<.001$), a relationship which was expected since the amount of assigned meters completed would, for the most part, be dependent on the athlete's attendance at the training session. The coach's report of training behavior displayed a higher relationship to training attendance ($r=.743$, $p<.001$) and training volume ($r=.67$, $p<.001$) than to the swimmer's self-report of the frequency, volume and intensity of training. Although this could be interpreted as a lack of communication between coach and athlete, meattendance and volume reportcompletion of training attendance and training volume reports before the completion of the coaching report may have subsequently effected the coach's subjective report of training behavior. Should there indeed be discrepancies between the coach's and athlete's perception of training behavior serious

Table 4.5

Correlations Between Behavioral Measures, Intention and Direct Measures of the Theory of Planned Behavior ($N=132$).

	Behavioral Measures				Intention	Direct Measures		
	1	2	3	4	5	6	7	8
1. Self Report	1.00							
2. Coach Report	.28**	1.00						
3. Training Volume	.34***	.67***	1.00					
4. Training Attendance	.32***	.73***	.90***	1.00				
5. Intention	.42***	.30**	.30**	.35***	1.00			
6. Attitude	.27**	.19*	.12	.22*	.42**	1.00		
7. SubNorm	.18	.07	-.01	.08	.23*	.26**	1.00	
8. PBC	.39***	.19*	.13*	.21*	.57***	.33***	.19*	1.00
*** $p < .001$ ** $p < .01$ * $p < .05$								

problems could arise. This is an issue which merits further study.

A three step hierarchical regression analysis was utilized in the prediction of the four measures of training behavior. Training intention was entered on the first step of each analysis. The measure of perceived behavioral control was entered on the second step of the analyses to investigate the direct effects of the measure on behavior. The direct measures of attitude and subjective norm were entered on the third step of the analysis. Table 4.6 displays the correlations (r) between the independent variables and the dependent measures of training behavior, the standardized regression coefficients (β), the multiple correlation (R) and the F value for each step of the analysis. In addition the incremental F ratio (F_{inc}) for the addition of each step is presented.

Intention was significantly related to the self-report of training behavior ($r=.49$, $p<.001$). The addition of perceived behavioral control on the second step of the analysis significantly improved ($F_{inc}=4.63$, $p<.05$) the prediction of the self-report. Both intention ($\beta=.38$, $p<.01$) and perceived behavioral control ($\beta=.24$, $p<.01$) contributed significantly to the prediction of behavior. The inclusion of attitude and subjective norm on the third step of the analysis did not significantly improve the prediction of the behavior measure ($F_{inc}=1.00$, $p=n.s.$). After the addition of the three direct measures of the theory of planned behavior only the measure of intention made a significant contribution ($\beta=.34$, $p<.01$) to the prediction of self report of training behavior.

Intention was also significantly correlated to the prediction of the coach-report of training behavior ($r=.31$, $p<.01$). After the second step of the analysis, with the addition of the measure of perceived behavioral control only the intensive measure contributed to the prediction of this behavioral measure ($\beta=.32$, $p<.01$). The addition of perceived behavioral control failed to reliably improve the prediction of behavior ($F_{inc}(1,82)=0.06$, $p=n.s.$). The addition of the attitude and subjective norm on the third step of the analysis also failed to significantly improve the prediction of coach-report of training ($R=.33$,

Table 4.6

Prediction of Training Behaviors Using Direct Measures of the Theory of Planned Behavior ($N=85$).

	Self-Report			Coach-Report			Training Volume			Training Attendance		
	<i>r</i>	β	<i>R</i>	<i>r</i>	β	<i>R</i>	<i>r</i>	β	<i>R</i>	<i>r</i>	β	<i>R</i>
Step 1 Intention	.49***	.49***	.49	.31**	.31**	.31	.32***	.32**	.32	.38***	.38***	.38
			$F(1,83)=24.30***$			$F(1,83)=9.05**$			$F(1,83)=9.38**$			$F(1,83)=13.76***$
Step 2 Intention PBC	.49*** .43***	.38** .24**	.54	.31** .14	.32** -.02	.31	.32*** .15	.33** -.02	.32	.38*** .19	.38** .00	.38
			$F(2,82)=15.05***$ $F(1,82)=4.63*$			$F(2,82)=4.48*$ $F(1,82)=0.06$			$F(2,82)=4.65*$ $F(1,82)=0.06$			$F(2,82)=6.80**$ $F(1,82)=0.00$
Step 3 Intention Attitude Subnorm PBC	.49*** .27** .30** .43***	.34** .07 .12 .21	.56	.31** .10 .18* .14	.31** -.02 .11 -.04	.33	.32*** .05 .10 .15	.34** -.07 .03 -.02	.33	.38*** .13 .19* .19*	.36** .00 .09 -.02	.39
			$F(4,80)=8.03***$ $F(2,80)=1.00$ $R^2=.31$ Adj $R^2=.26$			$F(4,80)=2.44$ $F(2,80)=0.93$ $R^2=.11$ Adj $R^2=.06$			$F(4,80)=2.37$ $F(2,80)=0.36$ $R^2=.11$ Adj $R^2=.06$			$F(4,80)=3.49*$ $F(2,80)=0.54$ $R^2=.15$ Adj $R^2=.11$

*** $p < .001$, ** $p < .01$, * $p < .05$

$F_{inc}(2,80)=0.93$, $p=n.s.$). A significant multiple correlation was not obtained following the inclusion of all the direct measures of the theory of planned behavior on the third step of the analysis ($R=.33$, $F(4,80)=2.44$, $p=n.s.$). Addition of the direct measures of the theory of planned behavior on the final two steps of the analysis failed to reliably improve the prediction of the coach-report of training behavior. Only the intention contributed significantly to the prediction of the behavior measure ($\beta=.31$, $p<.05$).

Training volume was significantly related to the measure of intention ($r=.32$, $p<.001$). The addition of the perceived behavioral control on the second step of the analysis failed to significantly increase the prediction of training volume ($R=.32$, $F(2,82)=4.65$, $p<.05$; $F_{inc}(1,82)=0.06$, $p=n.s.$). The measure of intention made the only significant contribution to the prediction of training volume on the second step of the analysis ($\beta=.33$, $p<.01$). The addition of the measures of attitude and subjective norm on the third step of the analysis failed to reliably improve the prediction of training volume ($F_{inc}(2,80)=0.36$, $p=n.s.$). With the four independent variables entered on the third step of the analysis a significant prediction of training behavior was not obtained ($R=.33$, $F(4,80)=2.37$, $p=n.s.$). Intention made the only significant contribution to the prediction of training volume at each step of the analysis (Step 1; $\beta=.32$, Step 2; $\beta=.33$, Step 3; $\beta=.34$, $p<.01$ for all steps). Intention was significantly related to training ($r=.35$, $p<.001$), followed in magnitude by perceived behavioral control ($r=.21$, $p<.05$). The direct measures of attitude ($r=.13$, $p=n.s.$) and subjective norm ($r=.02$, $p=n.s.$) were not significantly related to training behavior.

Intention was significantly related to training attendance ($r=.38$, $p<.001$). Addition of perceived behavioral control on the second step of the analysis failed to increase the prediction of training attendance ($R=.38$, $F(2,82)=6.80$, $p<.01$, $F_{inc}(1,82)=0.00$, $p=n.s.$). The inclusion of attitude and subjective norm on the third step of the analysis increased the multiple correlation (R) to .39 ($F(4,80)=3.49$, $p<.05$), an increase which was found not to be significant ($F_{inc}=.054$, $p=n.s.$). After all the variables were entered on the three steps of the analysis, only intention ($\beta=.36$, $p<.01$) proved to contribute significantly to

the prediction of attendance.

Intention provided the only significant contribution to the prediction of behavior after the entry of behavioral intention and the three direct measures of the theory of planned behavior in all four measures of training behavior. The addition of the direct measures of the theory of planned behavior failed to improve the prediction of actual behavior for each of the four measures. These results support the predictions of the theory of planned behavior (Ajzen, 1985, 1987, 1991). The finding that perceived behavioral control made a significant contribution to the prediction of the swimmer's self-reported training behavior did not violate the assumptions of the theory. Ajzen and Madden (1986) identified a potential direct link between perceived behavioral control and behavior. Ajzen and Madden (1986, p.459) note that the independent effect of perceived behavioral control is expected under two conditions: i) the behavior predicted must not be under complete volitional control, and ii) perceptions of control must reflect actual control in the situation with some degree of accuracy. The finding that perceived behavioral control made a direct contribution to the prediction of the self report measure would indicate that the other behavioral indicators were either under complete volitional control or the perceptions of control for those measures failed to reflect actual control. It seems unlikely that the other indicators were under any more volitional control than the self report measure, therefore it is more likely the measure of perceived behavioral control had failed to accurately reflect actual control the individual possessed over the completion of training as evidenced by the other measures. Although somewhat confounded by the fact that all three of these behavioral measures came from the coach, either in the form of self-report or coded behavioral measures, the issue of accuracy of perceived control or efficacious beliefs becomes important. Given the relatively long career length of the participants, sufficient feedback from the training environment should have been present to allow for accurate assessment of actual control over the completion of the frequency, volume and intensity of training. An overly optimistic assessment of the individual's ability to complete the prescribed course of action may, in the long term lead to confusion and frustration. Inability to meet the training standards, regardless of effort, may lead to a resultant

decrease in motivation (Harter, 1978). Since the present research includes no measures of actual control, only inferences can be made with respect to this issue. The accuracy of the relationship between perceived control and actual control is an area that requires further study.

4.2.4 Prediction of Training Intention

Given a strong relationship between intention and behavior, the theory of planned behavior was principally designed to predict behavioral intention (Ajzen, 1988). In order to test the efficacy of the theory in the prediction of training intent a four step hierarchical regression analysis was conducted with the strength of each succeeding model being compared to the previous version. The results are presented in Table 4.7. On the first step of the analysis, the measures of attitude and subjective norm were entered. The direct measures of the theory of reasoned action accounted for approximately 15% of the variance in behavioral intention ($R=.39$, $(F(2,82)=.739$, $p<.05$). Both attitude ($\beta=.26$, $p<.05$) and subjective norm ($\beta=.23$, $p<.05$) contributed significantly to the prediction of intention on the first step of the analysis. The addition of perceived behavioral control on the second step of the analysis raised the amount of variance accounted to over 30% ($R=.56$, $(F(3,81)=12.40$, $p<.001$). After the second step, perceived behavioral control ($\beta=.43$, $p<.001$) and attitude ($\beta=.20$, $p<.05$) were found to contribute significantly to the prediction of intention. Subjective norm ($\beta=.10$, $p=n.s.$) failed to contribute reliably to the prediction of training intention.

The finding that subjective norm failed to make a significant contribution is consistent with other research utilizing the theory of planned behavior in the prediction of exercise and physical activity. In fact, in a recent article regarding the usefulness of the theories of reasoned action and planned behavior for exercise promotion (Godin, 1993), subjective norm failed to make a significant contribution to exercise behavior in 17 of the 21 studies reviewed. As a result of his review Godin (p. 146) states "even when the

Table 4.7

Prediction of Training Intention using Direct Measures, Indirect Beliefs and Measures External to the Theory of Planned Behavior ($N=84$)

		<i>r</i>	β	<i>R</i>	<i>F</i>	<i>F_{inc}</i>
Step 1						
	Attitude	.33***	.26*			
	Subjective Norm	.30**	.23*	.39	7.39**	
Step 2						
	Attitude	.33***	.20*			
	Subjective Norm	.30**	.10			
	PBC	.51***	.43***	.56	12.40***	29.90***
Step 3						
	Attitude	.33***	.17			
	Subjective Norm	.30**	.05			
	PBC	.51***	.43***			
	Behavioral Beliefs	.23*	.05			
	Norm Beliefs	.18	.02			
	Control Beliefs	.23*	.09	.57	6.37***	0.54
Step 4						
	Attitude	.33***	.20			
	Subjective Norm	.30**	.02			
	PBC	.51***	.46***			
	Behavioral Beliefs	.23*	.00			
	Norm Beliefs	.18	.04			
	Control Beliefs	.23*	.11			
	Age	-.17	-.09			
	Competitive Level	-.14	.09			
	Career Length	-.08	-.14			
	Athletic Competence	.09	.03			
	Close Friendship	.04	.09			
	Behavioral Conduct	.03	-.05			
	Global Self Worth	.25**	.09	.61	3.27***	0.74
						$R^2=.37$
						Adj $R^2=.26$

*** $p < .001$, ** $.001 < p < .01$, * $.01 < p < .05$

influence of perceived social norms [subjective norm] has proven statistically significant, it has always had less influence on exercise than attitude". Given a significant zero-order correlation for the measure of subjective norm ($r=.30$, $p<.01$), it is evident that the measure is redundant with some linear combination of the other two direct measures of the theory, attitude and perceived behavioral control. It may be that the normative measure has significant impact on the measures of perceived behavioral control as evidenced by the numerous social support items identified in the pilot study as helping or assisting in the completion of training (see Table 4.3).

The inclusion of perceived behavioral control on the second step of the analysis was found to make a significant improvement in the prediction of intention ($F_{inc}(1,81)=29.29$, $p<.001$) demonstrating the increased predictive ability of the theory of planned behavior when compared to the theory of reasoned action. This result is consistent with previous research utilizing the theory of planned behavior. The addition of perceived behavioral control has been shown to significantly increase the prediction of intention for leisure time physical activities (Ajzen & Driver, 1992), undergraduate physical activity (Dzewaltowski et al., 1990), undergraduate aerobic class participation (Gatch & Kendzierski, 1990), regular exercise of power employees (Godin & Gionet, 1991) and regular vigorous physical activity in a national sample (Wankel et. al., 1993). This finding provides support for the second hypothesis examined in this research and is in accordance to the predictions made by the theory of planned behavior (Ajzen, 1985, 1987).

The addition of behavioral, normative, and control beliefs on the third step of the analysis failed to significantly improve the prediction of training intention beyond that of the direct measures of the theory of planned behavior ($R=.57$ ($F(6,78)=6.37$, $p<.001$; $F_{inc}(3,78)=0.54$, $p=n.s.$). Following the addition of these indirect measures of the theory of planned behavior only perceived behavioral control ($\beta=.43$, $p<.001$) was found to make a significant contribution to the prediction of intention. The addition of the selected external measures on the final step of the analysis failed to reliably improve the prediction

of behavioral intent beyond the direct measures of the theory of planned behavior ($R=.61$ ($F(13,71)=3.27, p<.001$; $F_{inc}(7,71)=0.74, p=n.s.$). Following the entry of all the variables into the regression analysis only perceived behavioral control was found to make a significant contribution to the prediction of intention ($\beta=.46, p<.001$).

4.2.5 Prediction of Direct Measures of the Theory of Planned Behavior

To gain an understanding of the formation of the direct measures of the theory of planned behavior, the values of attitude, subjective norm and perceived behavioral control were entered as dependent variables with the indirect measures of behavioral, normative beliefs and control beliefs entered on the first step of separate hierarchical regression analyses. The external variables of age, competitive level, career length, athletic competence, close friendship, behavioral conduct and global self-worth were entered on the second step. Results of these analyses are displayed in Table 4.8.

Over 14% of the variance of the attitude measure was predicted by the three indirect measures of behavioral, normative and control beliefs ($R=.38, F(3,84)=4.31, p<.01$). Although both the behavioral belief ($r=.32, p<.001$) and control belief ($r=.27, p<.01$) measures were significantly related to the measure of attitude, only behavioral belief ($\beta=.25, p<.05$) made a significant contribution to the prediction of the direct measure of attitude. The entry of the measures external to the theory of planned behavior on the second step of the analysis led to a significant improvement in the prediction of attitude ($F_{inc}(7,77)=4.54, p<.001$). The addition of age, competitive level, career length and the four measures of self-competence to the three indirect measures raised the amount of variance of the measure of attitude accounted for to almost 40 percent ($R=.63, F(10,77)=4.97, p<.001$). Following the entry of all variables into the equation the indirect behavioral belief measure ($r=.32, p<.001, \beta=.27, p<.05$) and the external measure of behavioral conduct ($r=.31, p<.01, \beta=.30, p<.01$) made significant contributions to the prediction of the direct measure of attitude. In addition the domain-measure of close

Table 4.8

Prediction of Direct Beliefs Using Indirect Beliefs and Measures External to the Theory of Planned Behavior

	Attitude (N=88)			Subjective Norm (N=89)			P. B. Control (N=87)		
	<i>r</i>	β	<i>R</i>	<i>r</i>	β	<i>R</i>	<i>r</i>	β	<i>R</i>
Step 1									
Behavioral Beliefs	.32***	.25*		.36***	.25*		.13	.14	
Norm Beliefs	-.02	-.20		.39***	.31**		.19*	.05	
Control Beliefs	.27**	.22	.38	.32***	.02	.47	.22	-.13	.23
			$F(3,84)=4.31^{**}$			$F(3,85)=8.17^{***}$			$F(3,83)=1.60$
Step 2									
Behavioral Beliefs	.32***	.27*		.36***	.27*		.13	.14	
Norm Beliefs	-.02	-.20		.39***	.30**		.19*	.25*	
Control Beliefs	.27**	.16		.32***	.03		.22	-.16	
Age	-.10	-.17		.02	-.02		-.13	-.18	
Competitive Level	-.23*	-.17		-.06	.00		-.17	-.20	
Career Length	.06	.18		-.09	-.06		.11	.25*	
Athletic Competence	.09	-.06		.03	-.01		.11	.10	
Close Friendship	-.17	-.23*		-.01	.04		-.15	-.14	
Behavioural Conduct	.31**	.30**		.10	.06		-.05	-.05	
Global Self Worth	.37**	.18	.63	.17	.04	.49	.18	.10	.44
			$F(10,77)=4.97^{***}$			$F(10,78)=2.42^*$			$F(10,76)=1.84$
			$Finc(7,77)=4.54^{***}$			$Finc(7,78)=0.19$			$Finc(7,77)=1.89$
			$R^2=.39$			$R^2=.24$			$R^2=.19$
			Adj $R^2=.31$			Adj $R^2=.14$			Adj $R^2=.09$

*** $p < .001$, ** $p < .01$, * $p < .05$

friendship made a significant contribution to the prediction ($\beta = -.23$, $p < .05$) although it was not significantly related to the attitudinal measure ($r = -.17$, n.s.).

The three indirect measures predicted over 22% of the variance in subjective norm ($R = .47$, $F(3,85) = 8.17$, $p < .001$). Both behavioral ($r = .36$, $p < .001$, $\beta = .27$, $p < .05$) and normative ($r = .39$, $p < .001$, $\beta = .30$, $p < .01$) beliefs made a significant contribution to the prediction of subjective norm, whereas control beliefs failed to make a reliable contribution. The addition of the external measures failed to improve the prediction of the direct measure of subjective norm ($R = .49$, $F(10,78) = 2.42$, $F_{inc}(7,78) = 0.19$, $p = \text{n.s.}$).

The three indirect measures of the theory of planned behavior failed to provide a significant prediction of the direct measure of perceived behavioral control ($R = .23$, $F(3,83) = 1.60$, n.s.). The addition of the seven selected external measures also failed to provide a reliable prediction of perceived behavioral control ($R = .44$, $F(10,76) = 1.84$, n.s.).

These findings provide support for the hypothesis (H4) that the effects of the external variables on behavioral intention are mediated through the direct and indirect measures. Evidence of this support is provided by the findings that the indirect and external measures made a significant contribution to the prediction of attitude, and the indirect measures contributed to the prediction of subjective norm but each failed to add to the prediction of training intention (see Table 4.7). Thus, the prediction of training intention was not improved by the information gathered from the indirect and external measures. However, these variables did assist in understanding the formation of the direct measures of attitude and subjective norm. Attitude was shown to be directly and significantly related to the individual's positive beliefs regarding training and the degree to which the individual likes the way he/she behaves, does the right thing, acts the way he/she is supposed to and avoids getting into trouble. Subjective norm was directly and significantly related to the measures of behavioral and normative beliefs. The inability to obtain a significant prediction of the measure of perceived behavioral control from the

indirect and external measures is somewhat more problematic. Since perceived behavioral control was found to make the largest relative contribution to the prediction of training intention (see Table 4.7) it seems important to have some insight into the formation of the construct. Results of research by Wankel, Mummery, Stephens and Craig (1993) showed a similar difficulty in obtaining a strong prediction of the measure of perceived behavioral control. If perceived behavioral control is indeed similar to self-efficacy as Ajzen (1990) has noted perhaps the sources of efficacy information could assist in the understanding of the formation of perceived behavioral control.

Work by Godin (Godin, Valois, Jobin & Ross, 1991; Godin & Gionet, 1991) has shown that measures of previous physical activity behavior and exercise habit have been significant in the prediction of exercise/physical activity intention. Since one source of self-efficacy information is performance attainment (Bandura, 1986), it is certainly possible that previous successful experience in exercise/physical activity could become a rich source of efficacy information for the individual. Unfortunately no measure of previous training behavior was assessed in the present study. A post hoc analysis regressing the measure of perceived behavioral control on the individual belief-based measures of perceived behavioral control with backwards elimination of the variables found individual perception of coaching support ($r=.23$, $p<.01$, $\beta=.18$, $p<.05$), self-motivation ($r=.31$, $p<.001$, $\beta=.20$, $p<.05$) and perceived ability ($r=.20$, $p<.01$, $\beta=.19$, $p<.05$) to be positively related, and frequent illness ($r=-.21$, $p<.01$, $\beta=-.27$, $p<.01$) and a lack of motivation ($r=-.33$, $p<.001$, $\beta=-.25$, $p<.001$) to be negatively related to the measure of perceived behavioral control. In total, the five items explained 27% of the variance in the measure of perceived behavioral control ($R^2=.27$, $F(8,130)=.000$, $p<.001$). If viewed in terms of efficacy information sources, coach support could be explained as a social influence which Bandura has identified as an efficacy source. Illness represents a physiological state and perceptions of ability may be viewed as a result of previous unsuccessful performance attainment. In any event, more research must be done to increase the understanding of the formation of this construct.

4.2.6 Prediction of Indirect Belief Measures

Separate regression analyses were utilized to analyze the contribution of the measures external to the theory of planned behavior to the prediction of the indirect measures of behavioral, normative, and control beliefs. The independent variables entered into the equation included age, competitive level, career length, and the self-perception domain measures of athletic competence, close friendship, behavioral conduct, and global self-worth. Results of these analyses are presented in Table 4.9.

Of the three indirect belief measures utilized, a significant prediction using the external measures was obtained only for that of behavioral beliefs. A multiple correlation of .38 ($F(7,95)=2.31, p<.05$) was obtained for the prediction of this indirect measure. The two external measures showing the strongest relationship to the indirect behavioral belief measure were athletic competence ($r=.27, p<.01; \beta=.18, p=n.s.$) and global self worth ($r=.30, p<.001; \beta=.26, p<.05$). The independent variables accounted for approximately 15% of the variance in the behavioral belief measure ($R=.38, F(7,95)=2.31, p<.05$).

In some instances the effects of the external variables on behavioral intention appear to be mediated by the indirect measures of the theory of planned behavior. The self-perceptive measures of athletic competence and global self worth are significantly related to the behavioral belief measure. The higher the individual's global self worth and perceived athletic competence the more positive the behavioral belief measure. The global self worth score also proved to be significant in the prediction of behavioral belief when controlling for all other external measures. The finding that individuals of higher global self worth display more positive behavioral beliefs is consistent with Harter's (1978) theory. In addition, physical self-perception has been positively associated with increased persistence in numerous youth sport studies (Roberts, Klieber & Duda, 1981; Feltz & Petlichkoff, 1983; Weiss, McAuley, Ebbeck & Weise, 1990). The present findings suggest

Table 4.9

Prediction of Indirect Belief Measures Using Measures External to the Theory of Planned Behavior

	Behavioural Beliefs ($N=103$)			Normative Beliefs ($N=104$)			Control Beliefs ($N=103$)		
	r	β	R	r	β	R	r	β	R
Age	-.03	-.02		.06	.14		-.05	-.04	
Competitive Level	.09	.11		-.15	-.12		-.12	-.12	
Career Length	-.04	-.03		-.17*	-.14		-.03	.03	
Athletic Competence	.27**	.18		-.05	-.02		.02	.04	
Close Friendship	.08	.05		.01	.03		.03	.02	
Behavioural Conduct	.13	.03		.09	.01		.11	.10	
Global Self Worth	.30***	.26*	.38	.12	.09	.26	.06	.00	.17
	$F(7,95)=2.31^*$ $R^2=.15$ Adj $R^2=.08$			$F(7,96)=0.97$ $R^2=.07$ Adj $R^2=.00$			$F(7,95)=0.39$ $R^2=.03$ Adj $R^2=.00$		

*** $p < .001$, ** $.001 < p < .01$, * $.01 < p < .05$

how the global and multi-dimensional measures of perceived self worth are related to an individual's more specific belief systems. These in turn are proposed, according to the theory of planned behavior, to be the basis for behavioral intention and ultimately behavior.

4.2.7 Direct Measures of Affective and Instrumental Attitude

In order to test the utility of the affective/instrumental split of the direct measure of attitude to predict training intention, the direct measures of affective and instrumental attitude and subjective norm were entered on the first step of a hierarchical regression analysis. The addition of perceived behavioral control to the second step of the analysis provided a test of the increased predictive ability of the theory of planned behavior over the theory of reasoned action. As a test of the theory of planned behavior, the indirect belief measures were entered on the third step of the analysis and the selected external measures on the third. Table 4.10 displays the results of these analyses.

The first step of the hierarchical analysis yielded a multiple correlation of .45 ($F(3, 81)=6.71, p<.001$). Only the direct measure of instrumental attitude ($\beta=.33, p<.01$) made a significant contribution to the prediction of training intention. Consistent with the theory of planned behavior, the addition of perceived behavioral control on the second step of the analysis significantly increased the predictive ability of the model ($F_{inc}(1,80)=20.99, p<.001$). The addition of perceived behavioral control increased the multiple correlation to .60 ($F(4,80)=11.51, p<.001$). Comparison of the standardized regression coefficients at this step of the analysis indicates that perceived behavioral control was the most significant contributor to the prediction of training intention ($\beta=.44, p<.001$) followed by instrumental attitude ($\beta=.32, p<.01$), subjective norm ($\beta=.05, n.s.$) and affective attitude ($\beta=-.01, n.s.$). Addition of the indirect behavioral beliefs on the third step of the analysis yielded no significant increase in the predictive ability of the model ($F_{inc}(3,77)=0.25, n.s.$). Similarly, the addition of the measures external to the theory of planned behavior on the

Table 4.10

Prediction of Training Intention using Affective/Instrumental Split of Direct Measures, Indirect Beliefs and Measures External to the Theory of Planned Behavior ($N=84$)

	<i>r</i>	β	<i>R</i>	<i>F</i>	<i>F_{inc}</i>
Step 1					
Affective Attitude	.22*	.04			
Instrumental Attitude	.41***	.33**			
Subjective Norm	.30**	.18	.45	6.71***	
Step 2					
Affective Attitude	.22*	-.01			
Instrumental Attitude	.41***	.32**			
Subjective Norm	.30**	.05			
PBC	.51***	.44***	.60	11.51***	20.99***
Step 3					
Affective Attitude	.22*	-.03			
Instrumental Attitude	.41***	.30**			
Subjective Norm	.30**	.03			
PBC	.51***	.44***			
Behavioral Beliefs	.23*	.05			
Norm Beliefs	.17	-.02			
Control Beliefs	.23*	.06	.61	6.50***	0.25
Step 4					
Affective Attitude	.22*	-.05			
Instrumental Attitude	.41***	.35**			
Subjective Norm	.30**	.00			
PBC	.51***	.45***			
Behavioral Beliefs	.23*	.00			
Norm Beliefs	.17	.00			
Control Beliefs	.23*	.08			
Age	-.17	-.12			
Competitive Level	-.14	-.07			
Career Length	-.08	.14			
Athletic Competence	.09	.04			
Close Friendship	-.04	.07			
Behavioral Conduct	.03	-.07			
Global Self Worth	.25**	.15	.66	3.86***	1.14
					$R^2=.44$
					Adj $R^2=.32$

*** $p < .001$, ** $.001 < p < .01$, * $.01 < p < .05$

fourth step of the analysis failed to reliably increase the prediction of training intention ($F_{inc}(7, 70) = 1.14, n.s.$). A significant multiple correlation was obtained on the fourth step of the analysis with all the independent variables entered into the equation ($R = .66, F(14, 70) = 3.86, p < .001$).

The partitioning of the singular direct measure of attitude into instrumental and affective measures provides insight into the formation of training intention in the adolescent competitive swimmer. This partitioning slightly increases the predictive ability of the model. The use of the non-partitioned attitude measure in combination with the measure of subjective norm and perceived behavioral control accounted for approximately 32% of the variance in training intention (see Table 4.7). The use of the affective and instrumental attitude in combination with subjective norm and perceived behavioral control accounted for 36% of the variance in intention. When comparing the contribution of the split attitude measure with that of the combined measure ($\beta = .20, p < .05$) it is apparent that the affective portion of attitude ($\beta = -.01, n.s.$) reduces the positive contribution of the instrumental measure ($\beta = .32, p < .01$) to training intention. These findings are in contrast to previous research in the area of physical activity and health behaviors which has demonstrated the importance of affective attitude in the prediction of behavioral intention (Ajzen & Timko, 1986; Godin, 1987). The current findings display the unique nature of training in the competitive environment. The central role that instrumental attitudes play in the prediction of adolescent training intention may be related to the differing expectations of competitive athletes compared to those of leisure-time physical activity participants. Subjects the present study apparently believe training to be necessary but not necessarily enjoyable, and intentions and behavior are derived from those beliefs. Previous research regarding participation motivation in sport has consistently identified aspects of competition (Klint & Weiss, 1986) and achievement/status (Gill et al., 1983; Gould et al., 1985) as factors related to ongoing sport participation. Since improved competitive outcomes are the product of successful training programs, it is conceivable that training behavior in competitive sport is related to different attitudinal domains than leisure-time physical activity participation.

4.2.7.1 Prediction of Affective and Instrumental Attitude

Separate hierarchical regression analyses were conducted for affective and instrumental attitude to gain an understanding about the underlying basis of each construct. The three belief measures were entered on the first step of each analysis. The addition of the external measures on the second step of the analysis provided a test of the assumptions of the theory of planned behavior regarding the ability for the belief measures to mediate the effects of the external variables. Results of these analyses are displayed in Table 4.11.

Addition of the belief measures on the first step of the analysis provided a reliable prediction of affective attitude ($F(3,84)=3.30, p<.05$). Behavioral ($r=.25, p<.01, \beta=.20, n.s.$) and control ($r=.19, p<.05, \beta=.20, n.s.$) beliefs were significantly related to affective attitude, but failed to make a significant contribution to the prediction of affective attitude. Normative beliefs also did not make a significant contribution in the regression analysis and were not significantly related to affective attitude. Addition of the external variables significantly improved the prediction of the affective attitudinal measure ($F_{inc}(7,77)=4.17, p<.01$). Following the addition of all variables only behavioral conduct was found to be significantly correlated to the dependent measure and to make a significant contribution to the prediction of that variable ($r=.25, p<.01; \beta=.23, p<.05$). Indirect control and behavioral beliefs, competitive level, close friendship and global self worth were significantly correlated to the measure of affective attitude but failed to make a significant contribution to the prediction of the construct. In addition, normative beliefs made a significant contribution to the prediction of affective attitude but was not significantly correlated to it.

Table 4.11

Prediction of Affective and Instrumental Attitude Using Indirect Beliefs and Measures External to the Theory of Planned Behavior ($N=87$)

	Affective Attitude			Instrumental Attitude		
	<i>r</i>	β	<i>R</i>	<i>r</i>	β	<i>R</i>
Step 1						
Behavioral Beliefs	.25**	.20		.33***	.21	
Norm Beliefs	-.08	-.23		.19*	.04	
Control Beliefs	.19*	.20	.32	.33***	.20	.37
		$F(3,84)=3.30^*$			$F(3,86)=4.66^{**}$	
Step 2						
Behavioral Beliefs	.25**	.20		.33***	.26	
Norm Beliefs	-.08	-.24*		.19*	.04	
Control Beliefs	.19*	.16		.33***	-.04	
Age	-.10	-.14		.04	-.11	
Competitive Level	-.23*	-.19		-.11	-.12	
Career Length	.05	.16		.09	.15	
Athletic Competence	.12	-.01		.01	-.07	
Close Friendship	.22*	-.27		-.01	-.08	
Behavioral Conduct	.25**	.23*		.26**	.26*	
Global Self Worth	.36***	.20	.59	.14*	-.02	.47
		$F(10,77)=4.18^{***}$			$F(10,77)=2.29^*$	
		$F_{inc}(7,77)=4.17^{***}$			$F_{inc}(7,77)=1.21$	
		$R^2 = .35$			$R^2 = .24$	
		Adj $R^2 = .27$			Adj $R^2 = .14$	

Note: R =multiple correlation; r =Pearson correlation; β =standardized regression coefficient
 *** $p < .001$, ** $.001 < p < .01$, * $.01 < p < .05$

Instrumental attitude, which played a significant determinant role in the prediction of training intention, was reliably predicted from a combination of behavioral, normative and control indirect beliefs ($F(3,86)=4.66$). All three, although significantly correlated to instrumental attitude, individually failed to make significant contributions to the prediction. Addition of the external variables failed to significantly improve the prediction of instrumental attitude ($F_{inc}(7,77)=1.21$, $p<.01$). Following the addition of all variables behavioral conduct was found to be the only item to be significantly correlated to the instrumental attitude and to make a significant contribution to the prediction of that construct ($r=.26, p<.01$; $\beta=.26, p<.05$). The three belief measures, and the global measure of self worth were significantly correlated to that of instrumental attitude, but failed to make a significant contribution to its prediction. The strength of the relationship between behavioral conduct (defined as the way one behaves, does the right thing, acts the way one is supposed to, and avoids getting into trouble) and instrumental attitude (defined as beliefs associated with the value or usefulness of training behavior) is interesting. Previous research using the theory of reasoned action has used moral obligation to assist in the prediction of selected behaviors (Gorsuch, Ortberg, 1983; Lane, Mathews & Presthold, 1990). Lane, Mathews and Presthold found that moral obligation was a significant predictor for intention of baccalaureate nurses to resign from their position. Gorsuch and Ortberg included a component of moral obligation in the study of behavioral intention in Baptist Sunday school classes. Results indicated that moral obligation added to the prediction of behavioral intent for behaviors in "moral-situations". In the present study, behavioral conduct considerations are useful in predicting instrumental attitudes. Individuals who perceive themselves as doing the right thing held more positive instrumental attitudes towards training. When these findings are considered in light of the research on moral obligation, it may be that competitive training is viewed by the participants as an issue of behavioral conduct. Subjects who viewed themselves as less likely to complete courses of action to conform to behavioral standards felt that training was less beneficial to them, raising the concept of self-fulfilling prophecy. This finding remains ripe for speculation, and requires replication in future studies to confirm the actual effects of positive behavior (or at least the perception of such) on instrumental

beliefs.

CHAPTER V

SUMMARY AND CONCLUSIONS

5.1 Summary

This research involved the testing of the ability of extended models of the theories of reasoned action (Ajzen and Fishbein, 1980; Fishbein & Ajzen, 1975) and planned behavior (Ajzen, 1985, 1991) to predict training behavior in adolescent competitive swimmers. Measures included i) intention; ii) direct measures of attitude, subjective norm and perceived behavioral control; iii) indirect measures of behavioral, normative and control beliefs, and iv) external measures of age, competitive level, career length, and competence domain measures (Harter, 1982) of global self-worth, behavioral conduct, close friendship and athletic competence. As recommended by Ajzen and Fishbein (1980), a pilot study consisting of 24 adolescent competitive swimmers was conducted to assist in the preparation of the final testing instrument. The final sample consisted of 169 adolescent competitive swimmers from 11 different Canadian competitive swimming clubs.

The theory of planned behaviour provided an efficacious description of training behaviour in the adolescent competitive swimmer. Multiple behavioral measures including swimmer report ($r=.49$), coach report ($r=.31$), training attendance ($r=.38$) and training volume ($r=.38$), were all significantly related to training intention. Intention was the only significant predictor of behaviour for training attendance, training volume and coach report of the constructs studied. For the swimmers' self-reported training behavior, both training intention ($\beta=.38$) and the measure of perceived behavioral control ($\beta=.24$) made significant contributions to the prediction. The theory of planned behavior provided a significantly better prediction of training intention than did its predecessor the theory of reasoned action. Attitude towards the behavior ($\beta=.20$) and perceived behavioral control ($\beta=.43$) made significant contributions to the prediction of training intention, whereas subjective norm did not. A summary of the relationships between the external measures,

the constructs of the theory of planned behavior, and the multiple training behavior measures is displayed in Figure 5.1

Attitude towards the completion of the frequency, volume and intensity of assigned training was reliably described from a combination of behavioral beliefs ($\beta=.27$) and the close friendship ($\beta=-.23$) and behavioral conduct ($\beta=.30$) measures from Harter's Adolescent Self Perception Profile (ASPP, Harter, 1988). This indicates that individuals who held positive beliefs regarding the benefits obtained from completing training, perceived that they generally act the way one is supposed to act, and perceived difficulty in making close personal friends, generally held positive attitudes towards training. The direct relationship of the belief-based measures of attitude to the direct measure of attitude is posited by the theory of planned behavior. The direct relationship between the behavioral conduct domain and attitude may reflect the moral obligation some athletes hold towards completing prescribed training. Previous research has shown the usefulness of including moral considerations in the prediction of intention and behavior in "moral situations" (Goisuch & Ortberg, 1983; Lane & Mathews, 1990).

The negative relationship between close friendship and attitude raises the issue of motives for participation and attitudes towards training in the sport of competitive swimming. Klint and Weiss (1987) reported that children high in perceived social competence were more motivated by social affiliation than by skill development. If the primary reason for participation in swimming is social, the demands of training may not be viewed as assisting in achieving that goal, and less positive attitudes towards training may be held. Since swimming is a solo and often solitary sport, training generally leaves the swimmers unable to communicate to teammates during training. The negative relationship between attitude towards training and the competence domain of close friendship may reflect the solitary nature of the sport. Given the findings of the pilot study which indicated that a frequent cost associated with training was loss of time for friends and other activities, it may be that individuals easily able to make close friends find the demands of the sport take away from their personal and social life. This could contribute

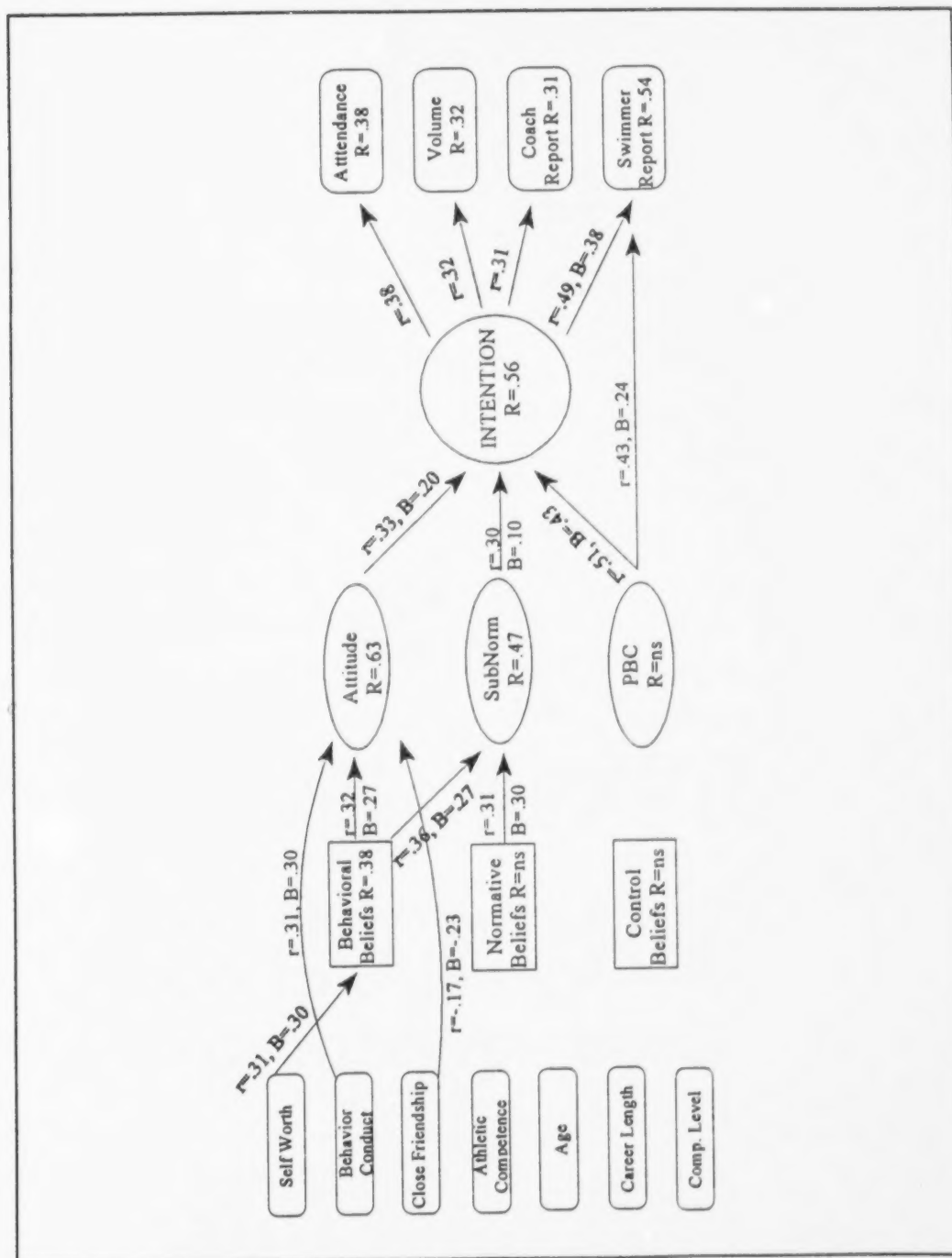


Figure 5.1 A summary of the relationships between external measures, variables of the theory of planned behavior, and selected training measures.

to the development of less favourable attitudes towards training. This finding illustrates a relationship by which an external cross-situational measure of behavior can influence training behavior. This occurs through the mediating effects of the intervening variable described by the theory of planned behavior. Measures of athletic competence, global self worth, age, competitive level and career length did not significantly contribute to the prediction of the direct measure of attitude.

Subjective norm failed to make a significant contribution to the prediction of training intention. This is consistent with a large amount of research conducted using the theories of reasoned action and planned behavior (cf., Godin, 1993). Numerous researchers have reported the measure to make a small (Gatch & Kendzierski, 1990; Schifter & Ajzen, 1985) or nonsignificant (Dzewaltowski, Noble & Shaw, 1990; Godin & Shephard, 1986; Theodorakis et al., 1991) contribution to the prediction of intention indicating that normative perceptions do not play a role in the formation of training intention. A significant portion of the variance of the measure of subjective norm ($R=.47$) was accounted for by a combination of the behavioral ($\beta=.27$) and normative belief ($\beta=.30$) measures. The relationship between normative beliefs and subjective norm is posited by the theory (Ajzen, 1985, 1987, 1991). The finding that behavioral beliefs contributed to the prediction of subjective norm indicates that those individuals who associated positive outcomes with training held stronger beliefs that significant others desire the performance of the behavior. It is likely that the views of important others may influence one's own beliefs concerning the outcomes of a given behavior.

The combination of belief-based measures of perceived behavioral control and external variables failed to produce a significant prediction of perceived behavioral control. This is problematic due to the relative importance of the measure to the formation of behavioral intention in the study population. Previous research in the area of vigorous exercise involvement has displayed similar difficulty in identifying the determinants of the perceived behavioral control measure (Wankel, Mummery, Stephens & Craig, 1994). Given the relative importance of perceived behavioral control to the prediction of

intention and behavior, it was deemed desirable to have more of an insight into its formation and a post-hoc analysis of the individual belief-based measures of perceived behavioral control was conducted in a fashion similar to that done by Ajzen and Driver (1991). This analysis identified the positive contribution to perceived behavioral control made by coach support, self-motivation, ability and a lack of illness.

Effects of the selected external variables of age, competitive level, competitive history, global self-worth, behavioral conduct, close friendships and athletic competence were mediated through the various constructs of the theory and made no direct contribution to the prediction of intention or behavior. The Adolescent Self Perception Profile domains of athletic competence ($r=.27$, $p<.01$) and global self-worth ($r=.30$, $p<.001$) were significantly related to the belief-based measure of attitude, with global self-worth being the only external variable to make a reliable contribution to the prediction of the belief-based measure of attitude ($\beta=.26$, $p<.05$). A significant prediction of the belief-based measures of subjective norm and perceived behavioral control was not obtained using the external variable selected for use in this study. The only significant relationship found in either of these analyses was a negative relationship between the normative beliefs and career length ($r=-.17$, $p<.05$). Career length, however, failed to make a significant contribution to the prediction of the belief-based measure of subjective norm.

The identification of affective and instrumental components of attitude towards the behavior illuminated the attitudinal contribution to the prediction of training intention. A summary of these results is displayed graphically in Figure 5.2. Instrumental attitude ($r=.41$, $p<.001$, $\beta=.35$, $p<.01$) made a larger relative contribution to the prediction of training intention than did affective attitude ($r=.22$, $p<.05$, $\beta=-.05$, n.s.). Indeed, affective attitude failed to reach significance in the prediction of intention. The pattern of contribution made by the affective and instrumental components of attitude showed that positive beliefs regarding the functional outcome of training (instrumental attitude), in combination with the perception of the capability to complete the course of action

(perceived behavioral control), were the prime determinants of training intention. The formation of intention seems unrelated to the affective feelings associated with the completion of such training. This finding is contradictory to that of Godin (1987) and Ajzen and Timko (1986) who both report significant positive relationships between the affective portion of attitude and intention in the area of exercise and health attitudes respectively. The difference between the present finding and that of Godin, and Ajzen and Timko, possibly lies in the nature of the behavior studied. In this case the behavior involved coach-directed training in a structured competitive environment, whereas Godin studied self-directed involvement in leisure-time exercise, and Ajzen and Timko studied similarly self-directed health-protective behaviours. Since the relative contribution of the direct measures of attitude, subjective norm and perceived behavioral control can vary as a function of the behavior in question (Ajzen & Fishbein, 1980), one would expect the relative contribution of the affective and instrumental component of attitude to fluctuate in a similar fashion. Additionally this finding need not be deemed contradictory to the research conducted in the areas of sport enjoyment, satisfaction, enjoyment and/or fun as the question at the heart of this research regards a specific subset of athletic participation - training behavior. As previously noted, research has reported a strong relationship between positive competitive outcome and enjoyment (cf., Fry et al., 1981; Wankel & Sefton, 1989). Training has now become a required component along the path to positive sport performance and subsequent enjoyment or satisfaction. As noted in the introduction, the ultimate expression of a successful training program is increased athletic performance. Should a successful outcome be obtained by diligent training, a generalized satisfaction and resultant increase in sport commitment may be attained.

5.2 Conclusions

With this sample of adolescent competitive swimmers the theory of planned behavior provided a credible description of training behavior. The theory provided a significantly better prediction of training intention than did its predecessor, the theory of

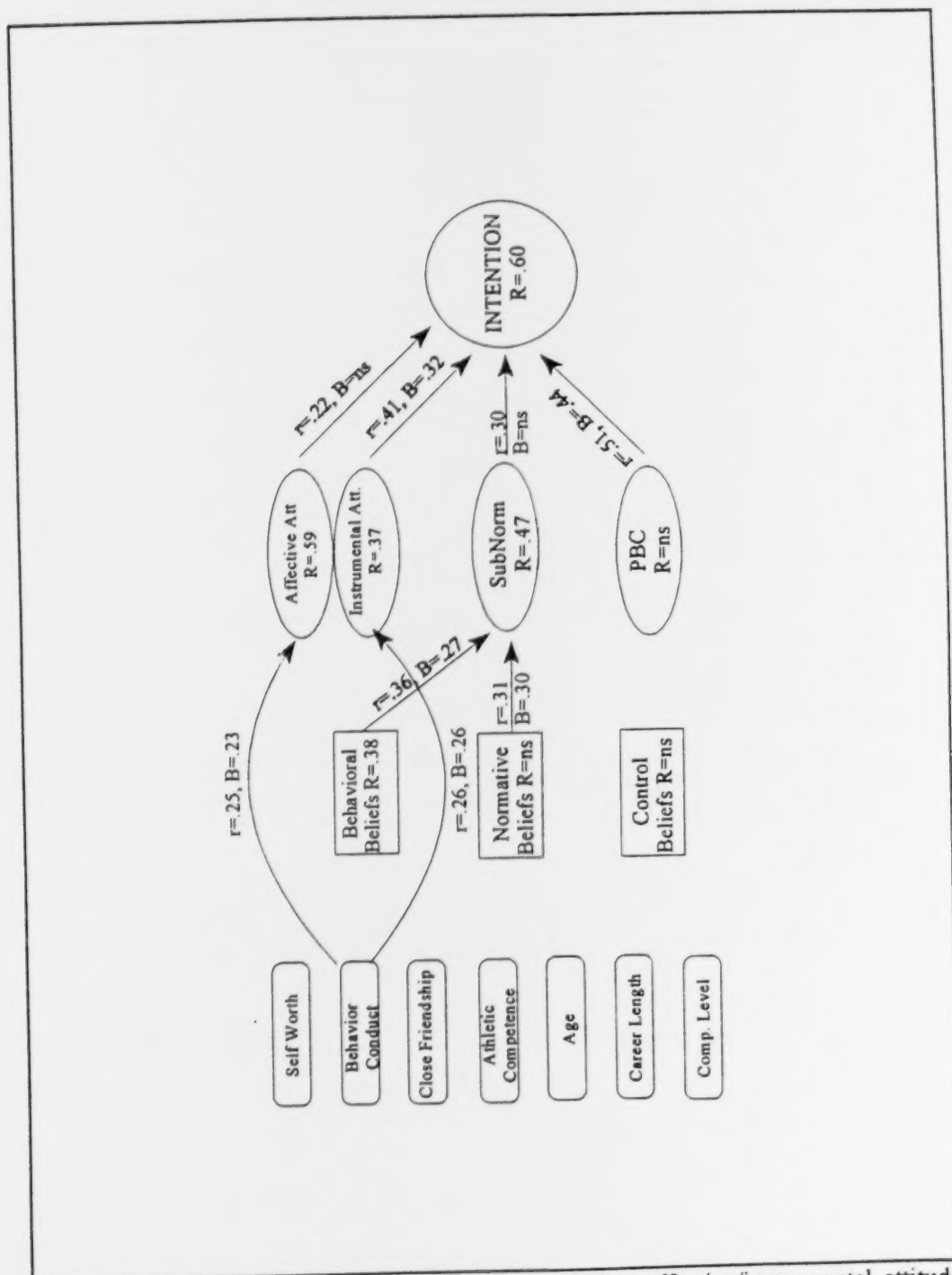


Figure 5.2 A summary of the relationships including affective/instrumental attitude split.

reasoned action. The addition of the perceived behavioral control measure significantly improved the prediction of intention and the prediction of the swimmer's self-reported training behavior. This finding underscores the importance of efficacious beliefs regarding the ability to summon the required resources, both internal or external, to complete the course of training. Although perceived behavioral control directly influences intention, it cannot be explained in terms of the belief-based measures of perceived behavioral control as operationalized in this study.

The combination of attitude towards training and perceived behavioral control made a significant prediction of training intention in this sample. The finding that the instrumental component of the overall attitude measure made a significant contribution to the prediction of intention emphasized the importance of the such beliefs held by participating athletes with respect to the formation of a positive training intention. The finding that the affective measure failed to contribute to the prediction of intention is likely related to the target behavior (training). Whereas enjoyment (positive affect) in sport has been related to ongoing participation (cf., Scanlan et al., 1993), this research attempts to identify what determines the individual intention to complete the frequency, intensity and volume of training in the sport of competitive swimming. As noted in the introductory pages of this report, training is aimed at the improvement of energy production and expression (Dick, 1978). This improvement, if planned and timed correctly, leads to improved performance in the competitive arena. Training, therefore, is outcome oriented. It is unlikely that many competitive athletes would enter into training without the expectation of improved performance as a result of their efforts. The training environment, however is only one aspect of the total sport experience. The competitive and social environments contribute to the overall experience and are bound to figure into the participants overall feelings regarding his or her sport experiences. It is important to understand the interaction between the competitive, social and training environments to strike a balance between the three to positively contribute to the ongoing participation of the athlete throughout his or her athletic career.

The effects of the domain measures of the Adolescent Self-Perception Profile (Harter, 1988) on training intention and behavior were mediated by the direct and indirect belief-based measures of the theory of planned behavior (Ajzen, 1985).

5.3 Recommendations

From a practical point of view the results of the present study lead to several recommendations for those involved in competitive training programs for adolescent swimmers.

- Since perceived behavioral control was found to make a positive and significant contribution to the prediction of training intention, and training intention was found to be positively and significantly related to training behavior, it is recommended that efforts be made to enhance perceptions of control over the completion of training held by the athletes involved in competitive training programs.
- Since attitude towards training was found to make a positive and significant contribution to the prediction of training intention, and training intention was found to be positively and significantly related to training behavior, it is recommended that individuals involved in competitive training programs emphasize and foster the formation of such positive attitudes towards training.
- Since the instrumental component of attitude towards training was found to make a positive and significant contribution to the prediction of training intention, and training intention was found to be positively and significantly related to training behavior, it is recommended that individuals involved in competitive training programs emphasize and understand the benefits associated with the completion of training. In addition, it is important for these benefits to be realized from following the training program. It is therefore important for the training to be

designed and administered to achieve the identified and desired outcomes.

Results of the present study leads to several recommendations for researchers in the social psychology of sport. From a theoretical point of view the following recommendations are made:

- Since the measure of perceived behavioral control was found to make a significant and positive contribution to the prediction of intention, and since the measures as operationalized in this study failed to give a significant prediction of perceived behavioral control, it is recommended that further research be aimed at understanding the formation of perceived behavioral control. Although analysis of individual belief-based measures of perceived behavioral control provided some insight into the formation of the construct, more work remains to be done to fully understand the formation of such efficacious beliefs.
- Given the significant relationship between the construct of behavioral conduct and attitude towards the behavior and the importance of attitude in the formation of intention, more research should been done to increase the understanding of the relationships between this adolescent self-perception profile domain and attitude. Such research may assist in the linking of such "trait"-like measures and specific behaviors.
- Finally, there is a need for the study of the accuracy of corresponding assessments of behavior made by the athlete and coach. Given the relatively low correlation between the coach-reported and swimmer-reported training behavior there remains a need to investigate the accuracy and consistency of such assessments.

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Appendix A
Pilot Study Questionnaire

WHAT ABOUT TRAINING?

Swimmer Questionnaire Form

The following questionnaire has been developed to find out about your attitudes and beliefs regarding training in competitive swimming. Training refers to the Frequency, Volume and Intensity of work you do in preparation for competition.

FREQUENCY refers to how OFTEN you train,

VOLUME refers to how MUCH you train,

INTENSITY refers to how HARD you train.

Please list as many of your feelings as you can for each question. Extra paper will be available if required.

THERE ARE NO RIGHT OR WRONG ANSWERS WE ARE INTERESTED IN YOUR TRUE OPINIONS. All answers are completely confidential.

DO NOT PUT YOUR NAME ON THE FORM.

Please hand in your sheets when you have finished.

THANK YOU.

List any BENEFITS or GAINS you can think of which could result from completing the frequency, volume or intensity of training assigned by your coach.

List any COSTS or DRAWBACKS you can think of which could result from completing the frequency, volume or intensity of training assigned by your coach.

List any things that you LIKE or ENJOY about completing the frequency, volume or intensity of training assigned by your coach.

List anything which you DISLIKE or HATE about completing the frequency, volume or intensity of training assigned by your coach.

What type of things can HELP or ASSIST you in your plans to complete the frequency, volume or intensity of training assigned by your coach.

What type of things can INTERFERE or HURT your plans to complete the frequency, volume or intensity of training assigned by your coach.

Who, if any, are the people that APPROVE of you completing the frequency, volume or intensity of training assigned by your coach.

Who, if any, are the people that DISAPPROVE of you completing the frequency, volume or intensity of training assigned by your coach.

Appendix B**Perceived Competence Items by Domain**

Athletic Competence

- Some teenagers think they could do well at just about any new athletic activity BUT other teenagers are afraid they might not do well at a new athletic activity.
- Some teenagers feel that they are better than others their age at sports BUT other teenagers don't feel they can play as well.
- Some teenagers do very well at all kinds of sports BUT other teenagers don't feel that they are very good at sports.
- Some teenagers don't do well at new outdoor games BUT other teenagers are good at new games right away.
- Some teenagers do not feel that they are very athletic BUT other teenagers feel that they are very athletic.

Behavioral Conduct

- Some teenagers usually do the right thing BUT other teenagers often don't do what they know is right.
- Some teenagers often get in trouble for the things they do BUT other teenagers don't usually do things that get them in trouble.
- Some teenagers feel really good about the way they act BUT other teenagers don't feel that good about the way they often act.
- Some teenagers do things they know they shouldn't BUT other teenagers hardly ever do things they know they shouldn't.
- Some teenagers usually act the way they know they are supposed to BUT other teenagers often don't act the way they are supposed to.

Close Friendship

- Some teenagers are able to make really close friends BUT other teenagers find it hard to make really close friends.
- Some teenagers do have a close friend they can share secrets with BUT other teenagers do not have a really close friend they can share secrets with.
- Some teenagers wish they had a really close friend they can share secrets with BUT other teenagers do have a really close friend to share things with.

Close Friendship (cont.)

- Some teenagers find it hard to make friends they can really trust BUT other teenagers ARE able to make close friends they can really trust.
- Some teenagers don't have a friend that is close enough to share really personal thoughts with BUT other teenagers do have a close friend that they can share personal thoughts and feelings with.

Global Self-Worth

- Some teenagers are often disappointed with themselves BUT other teenagers are pretty pleased with themselves.
- Some teenagers don't like the way they are leading their life BUT other teenagers do like the way they are leading their life.
- Some teenagers are happy being the way they are BUT other teenagers wish they were different.
- Some teenagers like the kind of person they are BUT other teenagers often wish they were someone else.
- Some teenagers are happy being the way they are BUT other teenagers wish they were different.

Appendix C
Main Study Questionnaire

Competitive Swimming Training Survey

- Part 1 -

DEPARTMENT OF PHYSICAL EDUCATION AND SPORT STUDIES
UNIVERSITY OF ALBERTA, EDMONTON, ALBERTA, CANADA

Swimming Training Survey

The following pages contain questions regarding yourself and your views on training in the sport of competitive swimming. Please answer all questions fully and honestly. **THIS IS NOT A TEST** and **THERE ARE NO RIGHT OR WRONG ANSWERS**. We are interested in your true opinions about training.

All information collected during this study will be kept in strict confidence and will be available **ONLY** to the research team. **AT NO TIME WILL INDIVIDUAL INFORMATION BE AVAILABLE TO ANYONE OUTSIDE THE RESEARCH TEAM.**

Personal Information

- a) Name: _____
- b) Age: _____
- c) Address: _____

- d) Team: _____
- e) Team Coach: _____
- f) Are you: Male Female (Please Circle One)
- g) How many years have you swam for a competitive club?
 (Please Circle One)
- 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
- h) How many times a week do you train during hard training?
 (Please Circle One)
- 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
- i) How many hours a week do you train during hard training?

PART A

ABOUT TRAINING

The following group of questions are aimed at gathering information about your beliefs and opinions about training in the sport of competitive swimming. Once again this is a survey and not a test. There are no right or wrong answers. We are interested only in your TRUE beliefs and opinions. For these questions, training in competitive swimming refers to;

- FREQUENCY* - the number of training sessions you are expected to attend.
VOLUME - the amount of training you are asked to complete (ie. total meters).
INTENSITY - how hard you are asked to work in each set.

INSTRUCTIONS:

Most questions in this portion of the survey make use of rating scales with 7 places. You are to make an "X" in the place that best describes your belief or opinion about that question or statement. For example, if your were asked to rate "Deep Dish Pizza" the seven places would allow you to indicate where your feelings lie between the two ends of the scale.

I think Deep Dish Pizza is great.

Strongly Agree : __:__:__:__:__:__: Strongly Disagree

If strongly agree with the statement then you would place your "X" at the "Strongly Agree" end of the scale as shown:

Strongly Agree : X:__:__:__:__:__: Strongly Disagree

If you really don't believe that deep dish pizza is great, then you would place your "X" at the "Strongly Disagree" end of the scale as shown:

Strongly Agree : __:__:__:__:__: X: Strongly Disagree

If you neither agree nor disagree with the statement, then you would place your "X" in the middle of the scale as shown:

Strongly Agree : __:__:__: X:__:__: Strongly Disagree

In making your ratings, please remember the following points: 147

- 1) Place your mark in the middle of the spaces, NOT on the boundaries.
- 2) Be sure to answer ALL items - please do not miss any.
- 3) NEVER put more than one "X" on a single question.

1. Your training program provides you with a chance to reach many different goals and objectives. How much do you agree with each of the following statements regarding possible outcomes of your training?
 - 1.1 Completing my assigned training in competitive swimming helps me achieve a sense of accomplishment
Strongly Agree :__:__:__:__:__:__:__:__:__: Strongly Disagree
 - 1.2 Completing my assigned training in competitive swimming helps me to improve my performance
Strongly Agree :__:__:__:__:__:__:__:__:__: Strongly Disagree
 - 1.3 Completing my assigned training in competitive swimming helps me meet new people.
Strongly Agree :__:__:__:__:__:__:__:__:__: Strongly Disagree
 - 1.4 Completing my assigned training in competitive swimming helps me to accept new challenges.
Strongly Agree :__:__:__:__:__:__:__:__:__: Strongly Disagree
 - 1.5 Completing my assigned training in competitive swimming helps me receive compliments.
Strongly Agree :__:__:__:__:__:__:__:__:__: Strongly Disagree
 - 1.6 Completing my assigned training in competitive swimming helps me to gain respect from others.
Strongly Agree :__:__:__:__:__:__:__:__:__: Strongly Disagree
 - 1.7 Completing my assigned training in competitive swimming helps me to increase my conditioning.
Strongly Agree :__:__:__:__:__:__:__:__:__: Strongly Disagree
 - 1.8 Completing my assigned training in competitive swimming helps me to improve my health.
Strongly Agree :__:__:__:__:__:__:__:__:__: Strongly Disagree
 - 1.9 Completing my assigned training in competitive swimming helps me increase my confidence.
Strongly Agree :__:__:__:__:__:__:__:__:__: Strongly Disagree
 - 1.10 Completing my assigned training in competitive swimming helps me to improve my self-image.
Strongly Agree :__:__:__:__:__:__:__:__:__: Strongly Disagree

- 1.11 Completing my assigned training in competitive swimming helps me to increase my mental toughness.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree
- 1.12 Completing my assigned training in competitive swimming helps me to increase my travel opportunities.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree
- 1.13 Completing my assigned training in competitive swimming helps me to have fun.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree
- 1.14 Completing my assigned training in competitive swimming helps me to reduce stress.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree
- 1.15 Completing my assigned training in competitive swimming helps me to gain rewards.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree
- 1.16 Completing my assigned training in competitive swimming helps me to improve my competitive ranking.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree
- 1.17 Completing my assigned training in competitive swimming helps me achieve a sense of self-fulfilment.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree
- 1.18 Completing my assigned training in competitive swimming helps me to improve my race strategy.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree
- 1.19 Completing my assigned training in competitive swimming helps me to become more competitive.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree
- 1.20 Completing my assigned training in competitive swimming helps me to increase my pain tolerance.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree
- 1.21 Completing my assigned training in competitive swimming helps me to keep busy.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree
- 1.22 Completing my assigned training in competitive swimming helps me to improve my attitude.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree

- 1.23 Completing my assigned training in competitive swimming helps me achieve my competitive goals.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree
- 1.24 Completing my assigned training in competitive swimming helps me to push myself.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree
- 1.25 Completing my assigned training in competitive swimming helps me to increase my popularity.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree
2. Many different individuals or groups have opinions regarding your training in competitive swimming. How much do you agree with the following statements about other peoples feelings regarding your training?
- 2.1 My teammates think I should complete all of my assigned training in competitive swimming.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree
- 2.2 My father thinks I should complete all of my assigned training in competitive swimming.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree
- 2.3 My mother thinks I should complete all of my assigned training in competitive swimming.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree
- 2.4 My grandparents think I should complete all of my assigned training in competitive swimming.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree
- 2.5 My teachers think I should complete all of my assigned training in competitive swimming.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree
- 2.6 My friends on my swim team think I should complete all of my assigned training in competitive swimming.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree
- 2.7 My friends NOT on my swim team think I should complete all of my assigned training in competitive swimming.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree
- 2.8 My brothers/sisters think I should complete all of my assigned training in competitive swimming.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree

- 2.9 My boyfriend/girlfriend thinks I should complete all of my assigned training in competitive swimming.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree
- 2.10 My competitors think I should complete all of my assigned training in competitive swimming.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree
- 2.11 My coach thinks I should complete all of my assigned training in competitive swimming.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree
3. Many things can assist you in the successful completion of training. Generally speaking, how much do you agree with the following statements about what can assist your training.
- 3.1 Good nutrition makes the completion of training much easier.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree
- 3.2 Support from parents makes the completion of training much easier.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree
- 3.3 Support from friends makes the completion of training much easier.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree
- 3.4 Support from coaches makes the completion of training much easier.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree
- 3.5 Support from teammates makes the completion of training much easier.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree
- 3.6 Proper sleep makes the completion of training much easier.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree
- 3.7 Self-Motivation makes the completion of training much easier.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree
- 3.8 Positive attitude makes the completion of training much easier.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree
- 3.9 Competition in training makes the completion of training much easier.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree

- 3.10 Lack of ability makes the completion of training much easier.
Strongly Agree :__:__:__:__:__:__: Strongly Disagree
- 3.11 School commitments makes the completion of training much easier.
Strongly Agree :__:__:__:__:__:__: Strongly Disagree
- 3.12 Negative peer pressure makes the completion of training much easier.
Strongly Agree :__:__:__:__:__:__: Strongly Disagree
- 3.13 Being tired/fatigued makes the completion of training much easier.
Strongly Agree :__:__:__:__:__:__: Strongly Disagree
- 3.14 Injury makes the completion of training much easier.
Strongly Agree :__:__:__:__:__:__: Strongly Disagree
- 3.15 Illness makes the completion of training much easier.
Strongly Agree :__:__:__:__:__:__: Strongly Disagree
- 3.16 Social Life makes the completion of training much easier.
Strongly Agree :__:__:__:__:__:__: Strongly Disagree
- 3.17 Poor nutrition makes the completion of training much easier.
Strongly Agree :__:__:__:__:__:__: Strongly Disagree
- 3.18 Lack of sleep makes the completion of training much easier.
Strongly Agree :__:__:__:__:__:__: Strongly Disagree
- 3.19 Friends makes the completion of training much easier.
Strongly Agree :__:__:__:__:__:__: Strongly Disagree
- 3.20 Lack of motivation makes the completion of training much easier.
Strongly Agree :__:__:__:__:__:__: Strongly Disagree
- 3.21 Negative attitude makes the completion of training much easier.
Strongly Agree :__:__:__:__:__:__: Strongly Disagree
- 3.22 Ability makes the completion of training much easier.
Strongly Agree :__:__:__:__:__:__: Strongly Disagree
- 3.23 Worry/Stress makes the completion of training much easier.
Strongly Agree :__:__:__:__:__:__: Strongly Disagree

.. Different things are important to different people. Please indicate how much you agree with the importance of the following things are (would be) to you.

- 4.1 Achieving a sense of accomplishment is very important to me.
Strongly Agree :__:__:__:__:__:__: Strongly Disagree
- 4.2 Improving my performance is very important to me.
Strongly Agree :__:__:__:__:__:__: Strongly Disagree
- 4.3 Meeting new people is very important to me.
Strongly Agree :__:__:__:__:__:__: Strongly Disagree
- 4.4 Accepting new challenges is important to me.
Strongly Agree :__:__:__:__:__:__: Strongly Disagree
- 4.5 Receiving compliments is very important to me.
Strongly Agree :__:__:__:__:__:__: Strongly Disagree
- 4.6 Gaining respect from others is very important to me.
Strongly Agree :__:__:__:__:__:__: Strongly Disagree
- 4.7 Increasing my conditioning is very important to me.
Strongly Agree :__:__:__:__:__:__: Strongly Disagree
- 4.8 Improving my health is very important to me.
Strongly Agree :__:__:__:__:__:__: Strongly Disagree
- 4.9 Increasing my confidence is very important to me.
Strongly Agree :__:__:__:__:__:__: Strongly Disagree
- 4.10 Improving my self-image is very important to me.
Strongly Agree :__:__:__:__:__:__: Strongly Disagree
- 4.11 Increasing my mental toughness is very important to me.
Strongly Agree :__:__:__:__:__:__: Strongly Disagree
- 4.12 Increasing my travel opportunities is very important to me.
Strongly Agree :__:__:__:__:__:__: Strongly Disagree
- 4.13 Having fun is very important to me.
Strongly Agree :__:__:__:__:__:__: Strongly Disagree
- 4.14 Reducing stress is very important to me.
Strongly Agree :__:__:__:__:__:__: Strongly Disagree
- 4.15 Gaining rewards is very important to me.
Strongly Agree :__:__:__:__:__:__: Strongly Disagree

- 4.16 Improving my competitive ranking is very important to me.
Strongly Agree :__:__:__:__:__:__: Strongly Disagree
- 4.17 Achieving a sense of self-fulfilment is very important to me.
Strongly Agree :__:__:__:__:__:__: Strongly Disagree
- 4.18 Improving my race strategy is very important to me.
Strongly Agree :__:__:__:__:__:__: Strongly Disagree
- 4.19 Becoming more competitive is very important to me.
Strongly Agree :__:__:__:__:__:__: Strongly Disagree
- 4.20 Increasing my pain tolerance is very important to me.
Strongly Agree :__:__:__:__:__:__: Strongly Disagree
- 4.21 Keeping busy is very important to me.
Strongly Agree :__:__:__:__:__:__: Strongly Disagree
- 4.22 Improving my attitude is very important to me.
Strongly Agree :__:__:__:__:__:__: Strongly Disagree
- 4.23 Achieving my competitive goals is very important to me.
Strongly Agree :__:__:__:__:__:__: Strongly Disagree
- 4.24 Having the opportunity to push myself is very important to me.
Strongly Agree :__:__:__:__:__:__: Strongly Disagree
- 4.25 Increasing my popularity is very important to me.
Strongly Agree :__:__:__:__:__:__: Strongly Disagree
5. All individual's have many different persons who are important in their life. In order to determine the people you find influential in your life please rate your level of agreement to the following statements.
- 5.1 It is important for me to do what my teammates think I should do.
Strongly Agree :__:__:__:__:__:__: Strongly Disagree
- 5.2 It is important for me to do what my mother thinks I should do.
Strongly Agree :__:__:__:__:__:__: Strongly Disagree
- 5.3 It is important for me to do what my father thinks I should do.
Strongly Agree :__:__:__:__:__:__: Strongly Disagree
- 5.4 It is important for me to do what my grandparents think I should do.
Strongly Agree :__:__:__:__:__:__: Strongly Disagree

- 5.5 It is important for me to do what my teachers think I should do.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree
- 5.6 It is important for me to do what my friends on the swim team think I should do.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree
- 5.7 It is important for me to do what my friends NOT on the swim team think I should do.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree
- 5.8 It is important for me to do what my brothers/sisters think I should do.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree
- 5.9 It is important for me to do what my competitors think I should do.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree
- 5.10 It is important for me to do what my boyfriend/girlfriend thinks I should do.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree
- 5.11 It is important for me to do what my coach thinks I should do.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree
- 5.12 It is important for me to do what my teammates think I should do.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree
6. Every person has a different training situation in training. With respect to your personal situation, how much do you agree with each of the following statements regarding your training program?
- 6.1 I maintain good nutrition.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree
- 6.2 I have the support of my parents in training.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree
- 6.3 I have the support of my friends in training.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree
- 6.4 I have the support of my coach in training.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree
- 6.5 I have the support of my teammates in training.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree

- 6.6 I maintain proper sleep habits during training.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree
- 6.7 I am self-motivated in completing my training.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree
- 6.8 I have a positive attitude about my training.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree
- 6.9 I have competition in training.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree
- 6.10 I lack ability in training.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree
- 6.11 I have many school commitments.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree
- 6.12 I feel negative peer pressure in training.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree
- 6.13 I am tired/fatigued in training.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree
- 6.14 I have many injuries in training.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree
- 6.15 I am often ill.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree
- 6.16 I have an active social Life.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree
- 6.17 I experience poor nutrition.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree
- 6.18 I lack sufficient sleep in training.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree
- 6.19 I have many friends.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree
- 6.20 I lack motivation in training.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree
- 6.21 I have a negative attitude in training.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree
- 6.22 I have ability in training.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree
- 6.23 I often experience worry or stress.
Strongly Agree :__:__:__:__:__:__:__:__: Strongly Disagree

Competitive Swimming Training Survey

- Part 2 -

DEPARTMENT OF PHYSICAL EDUCATION AND SPORT STUDIES
UNIVERSITY OF ALBERTA, EDMONTON, ALBERTA, CANADA

Swimming Training Survey

The following pages contain questions regarding yourself and your views on training in the sport of competitive swimming. Please answer all questions fully and honestly. **THIS IS NOT A TEST** and **THERE ARE NO RIGHT OR WRONG ANSWERS**. We are interested in your true opinions about training.

All information collected during this study will be kept in strict confidence and will be available **ONLY** to the research team. **AT NO TIME WILL INDIVIDUAL INFORMATION BE AVAILABLE TO ANYONE OUTSIDE THE RESEARCH TEAM.**

Personal Information

- a) Name: _____
- b) Age: _____
- c) Address: _____

- d) Team: _____
- e) Team Coach: _____
- f) Are you: Male Female (Please Circle One)
- g) How many years have you swam for a competitive club?
 (Please Circle One)
- 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
- h) How many times a week do you train during hard training?
 (Please Circle One)
- 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
- i) How many hours a week do you train during hard training?

Part B

WHAT I AM LIKE

We have some sentences here and, as you can see from the top of this sheet we are interested in what each of you is like, what kind of person you are like. This is a survey, not a test. There are no right or wrong answers. Since individuals are very different from each other, each of you will be putting down something different. Following is a sample sentence.

Really True About Me	Sort of True About Me		Sort of True About Me	Really True About Me
0.	: ____ :	: ____ :	Some teenagers like to go to the movies in their spare time	BUT other teenagers would rather go to sports events.

This question talks about two kinds of teenagers, and we wish to know which kind of teenager is most like you.

After reading the sentence you should first decide if you are most like the teenager on the left side who would rather go to the movies or whether you are more like the teenagers on the right side who would rather go to a sporting event.

- 2) Once you have decided which type of teenager you are most like, you must decide whether that is only sort of true about you or really true about you. If it is only sort of true, then put an "X" in the box under sort of true; if it is really true for you, then put an "X" in that box under really true.
- 3) For each sentence please check only ONE box. Sometimes it will be on one side of the page, sometimes it will be on the other. Please do not check both sides of the page, just the one that is most like you.
- 4) Once you have done the sample sentence please continue with the sentences below on your own. For each one, just check ONE box, the one that is most true for you, what you are most like.

PLEASE MAKE SURE TO ANSWER EACH QUESTION.

	Really True About Me	Sort of True About Me			Sort of True About Me	Really True About Me
1.	: ____ :	: ____ :	Some teenagers usually do the right thing	BUT	other teenagers often don't do what they know is right.	: ____ : : ____ :
2.	: ____ :	: ____ :	Some teenagers are able to make really close friends	BUT	other teenagers find it hard to make really close friends.	: ____ : : ____ :
3.	: ____ :	: ____ :	Some teenagers are often disappointed with themselves	BUT	other teenagers are pretty pleased with themselves.	: ____ : : ____ :
4.	: ____ :	: ____ :	Some teenagers think they could do well at just about any new athletic activity	BUT	other teenagers are afraid they might not do well at a new athletic activity.	: ____ : : ____ :
5.	: ____ :	: ____ :	Some teenagers often get in trouble for the things they do	BUT	other teenagers usually don't do things that get them in trouble.	: ____ : : ____ :
6.	: ____ :	: ____ :	Some teenagers do have a close friend they can share secrets with	BUT	other teenagers do not have a really close friend they can share secrets with.	: ____ : : ____ :
7.	: ____ :	: ____ :	Some teenagers don't like the way they are leading their life	BUT	other teenagers do like the way they are leading their life.	: ____ : : ____ :

	Really True About Me	Sort of True About Me				Sort of True About Me	Really True About Me
8.	: ____ :	: ____ :	Some teenagers feel that they are better than others their age at sports	BUT	other teenagers don't feel they can play as well.	: ____ :	: ____ :
9.	: ____ :	: ____ :	Some teenagers feel really good about the way they act	BUT	other teenagers don't feel that good about the way they often act.	: ____ :	: ____ :
10.	: ____ :	: ____ :	Some teenagers do very well at all kinds of sports	BUT	other teenagers DON'T feel that they are very good at sports.	: ____ :	: ____ :
11.	: ____ :	: ____ :	Some teenagers like the kind of person they are	BUT	other teenagers often wish they were someone else.	: ____ :	: ____ :
12.	: ____ :	: ____ :	Some teenagers wish they had a really close friend they can share secrets with	BUT	other teenagers DO have a really close friend to share things with.	: ____ :	: ____ :
13.	: ____ :	: ____ :	Some teenagers don't do well at new outdoor games	BUT	other teenagers are good at new games right away.	: ____ :	: ____ :
14.	: ____ :	: ____ :	Some teenagers find it hard to make friends they can really trust	BUT	other teenagers ARE able to make close friends they can really trust.	: ____ :	: ____ :
15.	: ____ :	: ____ :	Some teenagers do things they know they shouldn't	BUT	other teenagers hardly ever do things they know they shouldn't.	: ____ :	: ____ :

	Really True About Me	Sort of True About Me				Sort of True About Me	Really True About Me
16.	: ____ :	: ____ :	Some teenagers do not feel that they are very athletic	BUT	other teenagers feel that they ARE very athletic.	: ____ :	: ____ :
17.	: ____ :	: ____ :	Some teenagers usually act the way they know they are supposed to	BUT	other teenagers often DON'T act the way they are supposed to.	: ____ :	: ____ :
18.	: ____ :	: ____ :	Some teenagers DON'T have a friend that is close enough to share really personal thoughts with	BUT	other teenagers do have a close friend that they can share personal thoughts and feelings with.	: ____ :	: ____ :
19.	: ____ :	: ____ :	Some teenagers are happy being the way they are	BUT	other teenagers wish they were different.	: ____ :	: ____ :
20.	: ____ :	: ____ :	Some teenagers feel really good about the way they act	BUT	other teenagers don't feel that good about the way they often act.	: ____ :	: ____ :

Please check to ensure you have answered EVERY question. THANK YOU.

PART C

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The following group of questions are aimed at gathering information about your feelings regarding the next THREE WEEKS of your training in the sport of competitive swimming. Once again this is a survey and not a test. There are no right or wrong answers. We are interested only in your TRUE beliefs and opinions. As in Part B for these questions, training in competitive swimming refers to;

- FREQUENCY** - the number of training sessions you are expected to attend.
VOLUME - the amount of training you are asked to complete (ie. total meters).
INTENSITY - how hard you are asked to work in each set.

In making your ratings, please remember the following points:

- 1) Place your mark in the middle of the spaces, NOT on the boundaries.
- 2) Be sure to answer ALL items - please do not miss any.
- 3) NEVER put more than one "X" on a single question.

1. I plan to complete all of the assigned meters during the next three weeks of training.
Strongly Agree : ____:____:____:____:____:____:____: Strongly Disagree
2. If I wanted to I could easily complete the prescribed training over the next three weeks.
Strongly Agree : ____:____:____:____:____:____:____: Strongly Disagree
3. I plan to work at the intensity assigned during the next three weeks 6
training.
Strongly Agree : ____:____:____:____:____:____:____: Strongly Disagree
4. Most of the people who are important in my life would think I should complete all of my assigned training during the next cycle.
Strongly Agree : ____:____:____:____:____:____:____: Strongly Disagree
5. All things considered I have total control over the successful completion my prescribed training over the next three weeks of training.
Strongly Agree : ____:____:____:____:____:____:____: Strongly Disagree
6. It would be very easy for me to successfully complete the frequency, volume and intensity of the prescribed training for the next three weeks.
Strongly Agree : ____:____:____:____:____:____:____: Strongly Disagree
7. Most of the people who are important to me strongly approve of me completing my assigned training during the next three weeks.
Strongly Agree : ____:____:____:____:____:____:____: Strongly Disagree

8. I receive a great deal of support from the people closest to me in my efforts to complete all of my assigned training during the next three weeks.
Strongly Agree :__:__:__:__:__:__:__:__:__: Strongly Disagree
9. I have very little power over my ability to successfully complete training over the next three weeks.
Strongly Agree :__:__:__:__:__:__:__:__:__: Strongly Disagree
10. It is entirely up to me to successfully complete the prescribed frequency, volume and intensity of training for the next three weeks.
Strongly Agree :__:__:__:__:__:__:__:__:__: Strongly Disagree
11. People who are important to me don't really care if I complete all of my training as assigned during the next three weeks.
Strongly Agree :__:__:__:__:__:__:__:__:__: Strongly Disagree
12. I plan to follow the assigned training during the next three weeks of training.
Strongly Agree :__:__:__:__:__:__:__:__:__: Strongly Disagree
13. I will get a great deal of encouragement from the people most important to me to follow my training program as prescribed during the next three weeks.
Strongly Agree :__:__:__:__:__:__:__:__:__: Strongly Disagree
14. I plan to attend every required workout for the next three weeks of training.
Strongly Agree :__:__:__:__:__:__:__:__:__: Strongly Disagree
15. The final question deals with your feelings about training during the next three weeks. Please place an "X" to indicate where your feelings lie between the two ends of the scale for the question;

"FOR ME TO COMPLETE THE ASSIGNED FREQUENCY, DURATION AND INTENSITY OF TRAINING DURING THE NEXT THREE WEEKS WOULD BE..."

Important	:__:__:__:__:__:__:__:__:__:	Unimportant
Dull	:__:__:__:__:__:__:__:__:__:	Exciting
Enjoyable	:__:__:__:__:__:__:__:__:__:	Painful
Useless	:__:__:__:__:__:__:__:__:__:	Useful
Beneficial	:__:__:__:__:__:__:__:__:__:	Harmful
Unpleasant	:__:__:__:__:__:__:__:__:__:	Pleasant
Valuable	:__:__:__:__:__:__:__:__:__:	Worthless
Aggravating	:__:__:__:__:__:__:__:__:__:	Satisfying
Good	:__:__:__:__:__:__:__:__:__:	Bad
Boring	:__:__:__:__:__:__:__:__:__:	Fun
Productive	:__:__:__:__:__:__:__:__:__:	Unproductive
Detrimental	:__:__:__:__:__:__:__:__:__:	Constructive

Appendix D
Swimmer's Final Report

Swimmer's Final Report

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All information collected during this study will be kept in strict confidence and will be available ONLY to the research team. AT NO TIME WILL INDIVIDUAL INFORMATION BE AVAILABLE TO ANYONE OUTSIDE THE RESEARCH TEAM.

Personal Information

- a) Name: _____
- b) Age: _____
- d) Team: _____
- e) Team Coach: _____

The following group of questions are aimed at gathering information about your feelings regarding your recent training program. This is a survey and not a test. There are no right or wrong answers. We are interested only in your TRUE beliefs and opinions. Training in competitive swimming is categorized as;

- FREQUENCY* - the number of training sessions you are expected to attend.
- VOLUME* - the amount of training you are asked to complete (ie. total meters).
- INTENSITY* - how hard you are asked to work in each set.

In making your ratings, please remember the following points:

- 1) Place your mark in the middle of the spaces, NOT on the boundaries.
 - 2) Be sure to answer ALL items - please do not miss any.
 - 3) NEVER put more than one "X" on a single question.
-
- 1. I completed all of the assigned meters during the last three weeks of training.
Strongly Agree : ____:____:____:____:____:____:____: Strongly Disagree
 - 2. I worked at the intensity assigned during the last three weeks of training.
Strongly Agree : ____:____:____:____:____:____:____: Strongly Disagree
 - 3. I followed the assigned training during the last three weeks of training.
Strongly Agree : ____:____:____:____:____:____:____: Strongly Disagree
 - 4. I attended every required workout for the last three weeks of training.
Strongly Agree : ____:____:____:____:____:____:____: Strongly Disagree

Thank You for Completing this Survey

Appendix E
Coach's Final Report

COACH'S REPORT FORM

Please complete the report form on the reverse ensuring each swimmer is complete. Information in each column is to be entered as follows:

Column 1 Swimmer's name. Please print the swimmer's name.

Column 2 Age. Please enter current age

Column 3 Competitive Level. Please indicate by circling the highest level that each athlete is currently competing at using the coding;

- C - Club
- P - Provincial Championship
- Y - Youth Championship
- N - National Championship
- I - International.

Column 4 Attendance. Please report attendance information for each swimmer during the three week period in the following format;
Number attended / Number Assigned, for example 23/27.

Column 5 Training Volume. Please training volume information for each swimmer during the three week period in the following format;
Meters Completed / Meters Assigned, for example 102,00/143,000.
Please estimate as accurately as possible.

In the following items, circle a number to indicate the extent to which you believe the athlete to have complied with the prescribed training. The response range is from 1 (Very Poor) to 7 (Excellent).

Column 6 Attendance Compliance. On a seven point scale please indicate the level of training compliance displayed by each swimmer during the survey period with respect to the desired attendance.

Column 7 Volume Compliance. On a seven point scale please indicate the level of training compliance displayed by each swimmer during the survey period with respect to the desired training volume.

Column 8 Intensity Compliance. On a seven point scale please indicate the level of training compliance displayed by each swimmer during the survey period with respect to the desired training intensity.

Column 9 Overall Compliance. On a seven point scale please indicate the level of overall training compliance displayed by each swimmer during the survey period.

Coach's Name: _____

Club: _____

Address: _____

Number of Participating Athlete's: _____

Comments: _____

COACH'S REPORT FORM
(Instructions on reverse)

[illegible]

'Please circle the highest level this athlete is currently competing at:

- C - Club
P - Provincial Championship
Y - Youth Nationals
N - Senior National
I - International